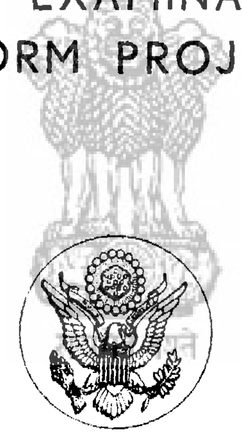
REPORT

OF THE

COMMITTEE

ON THE

INDIAN EXAMINATIONS REFORM PROJECT



UNITED STATES INFORMATION SERVICE

REPORT

OF THE

COMMITTEE

ON THE

INDIAN EXAMINATIONS REFORM PROJECT

CONTENTS

PAGE

Report 5

Summary of Recommendations 62

Appendix I 71

Appendix II 74

Appendix III 93

Appendix IV 95

सत्यमेव जयते

I

WE, the members of the Committee appointed by the Government of India to visit the United States for the purpose of studying the Examination methods in American universities, have the honour to submit our report.

We arrived in Washington, D.C., U.S.A., on the 23rd of August, 1958. We visited some leading American universities and various testing and examination services till 20th December, 1958. Four of us (*viz.*, Shri B. C. Asthana, Shri L. B. Deshpande, Shri V. K. Kothurkar and Shri R. Prasad) were in the United States visiting some more universities till the 20th of January, 1959. As we arrived in the United States prior to the fall opening of colleges and universities, we had an opportunity to examine the orientation stages of the American school year, to become familiar with the personnel services, operative during the early weeks of the semester, as well as to study during the fall the system of examinations, testing, counselling, guidance, placement and related work. Our visits to some institutions were made as a group; but for the most part we travelled in teams of two or three. We had full and interesting discussions with deans, professors, directors of testing services and other distinguished educators. The visit was financed through grants made under the provisions of the 'India Wheat Loan Programme' and our programme was chalked out and arranged in full consultation with us by the Committee on Leaders and Specialists, American Council on Education, 1785, Massachusetts Avenue, N.W., Washington 6, D.C. The arrangements were exemplary and we are deeply grateful to Dr. Adams, President of the Council, Dr. F. J. Brown, Director of the Committee, Dr. F. R. Mangold, Assistant Director, Mr. Wright Baker, Mr. Lewis Carnahan and other members of the Committee staff and all the local sponsors at the centres which we were privileged to visit, for the unfailing courtesy and readiness to help with which they looked after us and enabled us to fulfil our engagements in the United States.

We met in conference in Pittsburgh, Pennsylvania, U.S.A., on the 7th of December, 1958, after going through the programme chalked out for the teams of the Committee. We came to several conclusions during this conference, and a sub-committee consisting of four of us (Sarvashri Asthana, D'Souza, Gokak and Kothurkar) was appointed to prepare a draft report. The drafts prepared by members of the sub-committee were read out and discussed at two meetings of the Committee in Washington, D.C., on 13th December, 1958. Shri V. K. Gokak was then authorised to edit them and circulate the final draft to the members. We now submit our Report herewith.

II

EXAMINATIONAL procedures in modern India have an interesting history of their own and they have also gone through significant changes during the last century and half. An article in *The Statesman* dated 6th December, 1958, gives an interesting account of the earliest examinations held in the country:

"Amusing as it may appear today, examinations in the schools of Calcutta a century and a half ago were as much a social event as an educational affair. Formal invitations were sent out by the managements of the schools to the elite of the city, requesting their company at the function to encourage the candidates by their presence during the examinations. The guests, soberly dressed for the occasion, arrived on time and stayed as long as the examinations lasted. Europeans and Indians, men and women, were amongst those asked and, indeed, an invitation was considered an index of the social status of the invited.

"The schools wore a festive look and the austerity which marks present-day examinations was conspicuously absent. In the looks of the candidates one could read a sense of the self-importance they felt in being the heroes (and heroines) of the day; in the eyes of the teachers shone a beam of joy at the prospect of fulfilment of their mission.

"The subjects for examination were few and, therefore, the examinations were not prolonged but concluded in the course of the day. The results were declared the same day and the ladies and gentlemen invited to watch the ceremony did not leave without congratulating the successful candidates. Prizes were in cash and in kind: the successful candidates (and their teachers as well) were rewarded."

The second phase of our examinational history began when there were enough young men and women in the country qualified to compete for posts under its alien rulers, after having been educated through the medium of English in our schools and colleges. Though the system was dominated by considerations of utility, it did result in the spread of "liberal" education to some extent and in a recognition of merit. Examinations were a challenge and a stimulus to better performance and real achievement.

The third phase begins, curiously enough, with the regionalisation of the medium of instruction in our schools. A really progressive step, this shook the very foundations on which the system of higher education had been built up in the country. English gradually became an unreal and unreliable medium for examinations, if not for teaching. It even degenerated as a medium of instruction when graduates who had had their schooling through the regional medium grew to be university teachers. Many more knocked at the doors of our universities for higher education, and institutions of higher learning multiplied fast, without a corresponding increase in the number of genuinely capable teachers. Not much thought was bestowed on a reconsideration of the objectives and methods of higher education. If syllabi were modified here and there, the modifications were but superficial. In this way, the impartment of higher instruction became a highly mechanical and insipid task, and it rarely touched or tapped the individual. The only concrete outcome that the student looked forward to at the end of four years, was the degree certificate. It was not the certification of achievement that mattered, certification itself being an achievement. The essay-type examination had its limitations even when the work of assessment was done conscientiously. With the multiplication of students, and at the hands of inexperienced teachers, the process of testing lost what little reliability it possessed. It was easy for malpractices to creep in from the side of examinees as well as examiners. The only thing that mattered was the comprehensive examination at the end of the year. Students could therefore afford to neglect their studies for a good part of the year, and 'cram' desperately at the end. Examinations even became conducive to the development of neuroses in many students.

सत्यमेव जयते

A reconsideration of our examinational procedures has therefore come none too early. The Radhakrishnan Commission commented on the drawbacks in our present system, which is predominantly of the essay type, several years ago. Several studies have been published, both in the United Kingdom and the United States, which amply demonstrate the unreliability of the ratings of essay-type answers. Since so much in a student's life depends upon a single external examination, the tests must have a high degree of reliability and the minimum error of measurement. The New Type tests make it easy to secure a high degree of reliability in our examinations and we owe it to our students that we evaluate their performance in a more dependable manner.

High reliability can be secured by asking a large number of New Type questions and by seeing to it that the various kinds of competence sought in the course are represented in proper proportion. The current system is unsatisfactory even in the matter of sampling the limited objective of 'knowledge'. How can the information contained in two or three standard books be adequately sampled in eight or ten questions? A large number of short answer questions, constituting a part of the entire examination, can solve this problem of coverage to a great extent.

But the more fundamental question we have to ask ourselves is: what are we examining for? What are the objectives involved in the entire process of higher education and how far have examinations to take note of them? A good part of the degeneration in our present system of higher education is largely traceable to the fact that we have not faced this question squarely, much less answered it satisfactorily. The problem of examinational reform cannot be tackled in isolation. It is inextricably bound up with broader educational issues like those of the nature and purpose of our educational programmes. A consideration of examination reform is justifiable only in so far as it helps to start a chain reaction in the educational philosophies and practices obtaining at present in our universites. Viewed properly, examinations are not a sudden doomsday visitation, but the natural fruition and fulfilment of a long period of educational preparation and growth. Education is a process of bringing about certain 'behavioural' changes in desirable directions in the pupils who go through it. We expect that, at the end of the educational process, the student will be different in some well-defined way, from what he was when the process began. What are these desirable directions of change? What are the changes that we wish to bring about in our pupils? What are the objectives, to the achievement of which the entire process of education is geared? We can have valid examinations only on the basis of a definition and specification of these objectives. Examinations are nothing more than a systematic gathering of evidence regarding the extent to which 'behavioural' changes envisaged in our curricula and teaching process, have actually occurred in a given set of students. A clear statement of objectives is therefore the main criterion by which the validity of our examinations should be judged. Otherwise examinations will be purely arbitrary and external to the educational process. They will tend to become stereotyped, traditional and mechanical rituals instead of being productive and creative experiences. When they are not geared to well-defined objectives, they tend to be tied down to a dull and narrow routine, a fixed and rigid pattern that is not sufficiently sensitive to the rich and diverse growth which is education. An explicit definition of objectives not only gives direction to learning and training experiences, but is quite integral to the very meaning and validity of examinations.

It is possible, of course, to continue examining as we have been doing in the past and to fabricate such rational explanations as we can in support of the *status quo* when we are challenged on the validity of our present procedure. It is also possible to improvise half-hearted and rough-and-ready after-thoughts on educational objectives and to quell critical inquiry with vague formulations like 'preparation of the student for a good life', 'training the student to be a useful member of society', 'intellectual discipline', 'development of the critical faculty' and so on. Formulations of this kind are far too general to guide class-room practices or actual evaluation techniques. We do not intend to suggest that these statements are untrue or undesirable. But nothing can be done about them unless they are elaborated into concrete specific behavioural changes in students.

How, then, are we going to specify these objectives in terms of each subject? In his paper on constructing achievement tests, Dr. Ralph W. Tyler shows that a test construction involves several steps. (We summarise herewith his statement on the subject.)

1. *Formulation of course objectives.*

2. *Definition of each objective in terms of student behaviour.*

3. *Collection of situations in which students are expected to reveal whether they have achieved each one of the objectives*—The nature of the objectives determines the variety of the achievement tests to be constructed. The measurement of the information which a student possesses may be done with a paper-and-pencil examination. A test of skill in the 'use of the microscope', would, on the other hand, require a different set-up. Again, if a test is meant to measure, not the student's memory of certain facts but his ability to interpret them when they are presented to him, the test will have to be constructed in a different way. Textbooks in zoology, for instance, describe certain experiments that have been performed which show that a frog responds to light stimuli in his feeding reactions. A textbook analysis would include a description of these experiments, but on the usual basis of test construction, it would be assumed that the student is expected to remember these descriptions. A test would then be constructed which would disclose whether or not the student remembers the details of these experiments. But what is aimed at now is not merely an indication of the way in which the content is covered by the student. What the test is expected to do is to define the reactions which a student is expected to make of this content. Thus, if one of the course objectives is to measure the student's ability to draw inferences from facts, it is not then expected that a student will remember the details of the experiment. Upon being given the details, he should be able to interpret the experiment for himself. In the test constructed for measuring the achievement of this objec-

tive, the student will be permitted to observe the experiment dealing with the feeding reactions of frogs or to read the results of such an experiment. From the facts thus obtained, he will be asked to propose hypotheses which would constitute reasonable inferences from these experiments. Thus the same content can be used, either for measuring the student's memory of the facts or his ability to interpret them when they are presented to him. The usual method of test construction, based upon an analysis of informational content alone, would not have made us aware of the need to test students on the achievement of this important objective, the ability to draw inferences from facts. But the formulation of course objectives and their definition in terms of expected student behaviours makes us aware of it. It indicates what the tests are constructed to measure and defines the variety of tests essential for an inclusive measurement of student achievement. When present standard tests are compared with an analysis of this kind, large areas are found which are as yet untouched. A mere enumeration of the data obtained by such a formulation and definition shows the large amount of raw material which was untouched before and which can form a direct basis for a variety of test constructions. It will thus be seen that a test has to be constructed, or an examination paper set, by collecting a sampling of situations which might be used to test each of the objectives formulated for the course. For instance, for testing on the course objective proposed above for zoology, the ability to draw inferences from facts, the most productive source of test situations is the current research in the field of zoology. From this source, the results of new experiments can be obtained which can be presented to students to test their ability to interpret these experiments. Since they are new experiments, the students cannot interpret them from memory of textbook interpretations. Similarly, the productive sources for testing on another course objective in zoology, the ability to propose ways of testing hypotheses, can be found in the problems proposed for investigation by various research workers in the field. Since these problems have never been investigated, the student cannot depend upon his memory of the method of attack used by others. For each objective, the ingenuity of the test technician (he is a specialist—trained personnel of this kind will have to be employed in our universities as directors of testing services) and of professors in the departments concerned is required in order to find productive sources of test situations.

4. *Presentation of situations to students*—This is primarily the function of the test constructor. He must develop a method of administration which makes it possible to present these situations to the students and to get a record of their reactions. (He will have to advise the professors or the internal examiners and paper-setters, who have collected such situations, on the best manner of presenting them to the students.) Assuming that the cultivation of accuracy of observation is one of the course objectives in zoology, on which students have to be tested, it would be necessary for the test constructor to have experiments performed which could be observed by every student in the group and then to develop a record blank upon which the student could record his observations. In testing skill in use of the microscope, it would be necessary to develop a check list of student reactions so that an observer could make a record of the reactions of each student in his attempt to use the microscope. Those situations which are verbal in character, such as the memory of important principles, are easily presented to students in written examinations.

5. *Evaluation of student reactions or performance in the light of each objective*—This is essentially a co-operative step. The teachers of the subject have certain functions in it and the test technician and examiners (the examiners, paper-setters or moderators till a test technician is available) certain other functions. The teachers (*i.e.*, the mem-

bers of the Board of Studies in the subject concerned—in an affiliating university, they represent the university teachers) can formulate the standards to be used in evaluating students' reactions or performance, just as they can collect test situations and pass them on to the paper-setters. Evaluations which are not wholly objective in character, should be made by paper-setters or moderators themselves and not by other examiners. In the case of tests of information, the paper-setters or moderators should prepare a key which is wholly or almost wholly objective and other examiners can score the students' reactions. In the case of tests of ability to draw inferences from facts, it would be necessary for the Boards of Studies to set up standards to be used in evaluating students' inferences and the paper-setters or moderators themselves will have to evaluate the responses since these standards are not wholly objective.

6. *Determining the objectivity of evaluations, for those evaluations which are not wholly objective*—For instance, the method determining the objectivity of the evaluations of students' inferences would be to have these inferences judged by several paper-setters or moderators, judged independently, and then to determine the variations in the evaluations of each paper.

7. *Improvement of objectivity of evaluation when necessary*—This procedure would be necessary if there is found to be any significant variation in the evaluation from one paper-setter or moderator to another. A relatively high degree of objectiviy can be obtained by using the mean of the ratings of three paper-setters.

8. *Determination of reliability*—This is necessary in order to determine the adequacy of the sample of test situations used to measure each objective.

9. *Improvement of reliability, when necessary.*

10. *Development of more practicable methods of measurement, when necessary*—We say nothing more here about steps 8, 9 and 10 as they fall more properly within the province of the test technician and an untrained paper-setter or examiner cannot be expected to handle them satisfactorily. But a great deal of reform in our examinational methods can be achieved even if we realise the full import of the first seven steps and implement them in their entirety in our universities.

It will thus be seen that the construction of achievement tests is a co-operative enterprise. "No test technician alone, unless he is an expert in the field of subject matter, can construct an achievement test which is certain to be valid." The members of the Board of Studies concerned must formulate the course objectives, must define the objectives in terms of student behaviour, must collect situations (and pass them on to the board of paper-setters who may make use of them, supplementing or supplanting them as deemed proper) which are calculated to test students on their achievement of each one of the course objectives and must provide the method of evaluating the students' reaction or performance in the light of each objective. The test technician (if he is available) and the board of paper-setters in the subject, set up the specifications for the course objectives and for the definition of objectives in terms of student behaviour. They must assist in the collection of test situations, formulate a plan for presenting the situations to students, set up specifications for the evaluation of students' reactions or performance and determine the objectivity of the evaluations. The test technician must also develop a plan for improving objectivity when necessary and he must determine the reliability of the test, and improve the reliability, when necessary. The board of paper-setters concerned and the test technician together must develop more practicable methods of measurement, when necessary, while the test technician determines their validity and reliability.

The trouble with our examinations is that the test items are drawn directly from an analysis of the informational content of the course only. It may be argued that there is a very high relationship between measurements of information in a field and intelligence or ability to think in the material of that field. There is some measure of truth in this contention with reference to advanced courses. Nevertheless, the correlations, generally speaking, are all too low for one to obtain valid measurements by using the information test only. The fact that there are other objectives to be measured besides information, is not adequately emphasised. And tests need to be constructed for each of the important objectives in a course. The usual method of test construction, based upon an analysis of informational content alone, will not meet this demand.

How are the objectives in a course to be formulated? Obviously, this can only be done by experts meeting together in conference. It is not enough if a Board of Studies here or there considers the objectives implicit in a course of studies. If we are aiming at a total revision of values in our system of higher education, it would be necessary for the representatives *of all the Boards of Studies in Indian universities in each one of the subjects of study* to meet together in conference for formulating course objectives and for defining them in terms of student behaviour. This is an urgent and imperative need. To ensure the success of such a conference, it would be equally necessary for its delegates to acquaint themselves with at least a few leading contributions to the thinking on this subject of testing and measurement during the last thirty years and more. We would also submit that the success of such conferences will be further ensured by the participation of foreign experts in the subject concerned, who are also conversant with these new developments in the philosophy of higher education. We will be glad to attend similar conferences in our own respective subjects.

In the paper referred to above, Dr. Ralph Tyler gives an account of the conclusions he arrived at after his work with several departments of Ohio State University. He found at least eight major types of objectives:

Type 'A', *Information,* which includes terminology, specific facts and general principles.

Type 'B', *Reasoning,* or Scientific Method, which includes induction, testing hypotheses and deduction.

Type 'C', *Location of Relevant Data,* which includes a knowledge of sources of usable data and skill in getting information from appropriate sources.

Type 'D', *Skills Characteristic of Particular Subjects,* which includes laboratory skills in the sciences, language skills and the like.

Type 'E', *Standards of Technical Performance,* which includes the knowledge of appropriate standards, ability to evaluate the relative importance of several standards which apply, and skills or habits in applying these standards.

Type 'F', *Reports,* which includes the necessary skill in reporting projects in engineering or reporting experiments in science and the like.

Type 'G', *Consistency in Application of Point of View,* which is most apparent in courses in philosophy.

Type 'H', *Character,* which is perhaps the most inclusive, involving many specific factors.

He then proceeds to show how each of these eight objectives was defined in terms of the behaviour expected of students with reference to the elementary college courses in zoology: "In defining the first objective a fund of information about animal activities and structures, the specific facts and general principles which the students should be able to recall without reference to textbooks or other sources of information, were indicated. The second objective, an understanding of technical terminology, was defined by listing the terms which the student himself should be able to use in his own reports, and another list of terms which he would not be expected to use, but should be able to understand when he finds them in zoological publications. The third objective, an ability to draw inferences from facts, that is to propose hypotheses, was defined by describing the types of experiments which a student should be able to interpret. The fourth objective, ability to propose ways of testing hypotheses, was defined by listing the types of hypotheses which a student should be able to validate by experiment, or propose ways of validation. The fifth objective, an ability to apply principles to concrete situations, was defined by listing the principles which students should be able to apply and types of concrete situations in which the student might apply these principles. The sixth objective, accuracy of observation, was defined by listing the types of experiments in which students should be able to make accurate observations. The seventh objective, skill in use of the microscope and other essential tools, was defined by describing the types of microscopic mounts and types of dissections which elementary students should learn to make. The eighth objective, an ability to express effectively ideas relating to zoology, was defined by indicating the nature of the reports, both written and oral, which zoology students are expected to make and the qualities demanded for these reports to be effective."

It is pleasing to think what a far-reaching change will come about in our process of higher education if our syllabuses were to be framed with a clear analysis of the objectives desired, like the one given above. A course could be divided into papers, not on the basis of the informational content of a subject, but on the basis of the objectives which the student has to achieve in his study of that subject. Even if a paper or course unit were to reflect several of the objectives, they could still be sharply demarcated from each other and given their relative importance. Again, the technique of test construction will also have undergone a vast change. The analysis of objectives will have to come into play in place of the analysis of content alone. As Dr. Tyler remarks, "This reveals a much wider field for objective testing than is likely to occur to the test constructor who depends upon an analysis of content." This is even more important than an employment of New Type questions on each and every occasion. For example, "the true-false test may be a superior method for testing the students' memory of information, yet it might be quite inferior as a means of testing his ability to organise ideas." Again, "the test situations used in this technique are not selected from a few general type of tests, now in use, but are obtained directly from the analysis of the course objectives in terms of student behaviour."

सत्यमेव जयते

Let us see what behavioural changes are expected to be produced in students by a social science course. First of all, the student should have an adequate knowledge of the specifics of his subject, its substantive content, methods and terms. He should be in a position to grasp its reasons and relationships, principles, theories, abstractions and universals. Secondly, he will have to develop social science skills in identifying an author's line of reasoning, analysing an argument into its constituent parts, seeing their interrelationships, reaching out for hidden assumptions, validating the inner coherence and consistency of the reasoning confronting the author's view-point with opposite views from other writers, isolating the issues of disagreement and appreciating the kinds of evidence required to resolve such conflicts. He should not confine his attention to his own society and culture but deal as well with other societies with widely contrasting cultures. He should be encouraged to look for similarities and differences in diverse societies and cultures. Thirdly, he should be able to apply the theories of social science to the practical issues of social policy. Fourthly, he should develop the analytical faculty, the capacity to appreciate the value of disinterested inquiry into the nature of man and society. He should show the ability to cultivate such a study for himself by making sensitive distinctions between science on the one hand and superstition, special pleading and propaganda, on the other. Fifthly, he should be familiar with all the outstanding theories and hypotheses in his particular field and be able to evaluate these theories in terms of scientific method. Lastly, he should be able to deliberate rationally and in an informed way on problems of public policy. Having comprehended the conditions of deliberate social change and planning, he should be aware of the fact that planned change presupposes some definite scheme of values. He should be able to compare and contrast alternative systems of values and view his country's development in a broad perspective and thus clearly understand the problems of policy.

This is just a tentative sketch and does not pretend to be anything more than a casual scrutiny of the objectives implied in a social science course. The process of defining objectives and organising course work as well as examinations round them is an arduous task and it may call for a series of conferences and workshops in which specialists and subject-matter experts will discuss the issues involved and come to conclusions. It would be necessary to organise extended seminars of an all-India composition before clarification and agreement are arrived at. We recommend that seminars of this kind may be organised for half a dozen subjects at least, each year.

We have, of course, to remember that not much can be done merely by preparing formal statements of aims. "The interest of faculty members in educational reforms comes when they are asked to do something about their own teaching or when they are asked to draw up a statement of their own which can explain what they are doing in their courses. It is only when specific proposals for new methods, new reforms, new courses, are made to faculty members that it becomes evident what aims the faculty members have in mind, since, if a proposal is rejected, it is rejected for a reason which must be given, or, if it is being argued by its proponent, it must be backed by a statement of what the proposal is designed to bring about. The objectives of any institution are more clearly revealed by the actual practices in operation than by the statements that it makes for publication. Therefore, the first question to answer is: How can the knowledge of educational objectives become a meaningful part of the teacher's experience, and a conscious part of his own teaching? Stated objectives and actual practices should continually be checked against each other." (*Improving College Instruction,* Report edited by Fred J. Kelly, American Council on Education Studies, pages 48, 49, 50 and 63.)

सत्यमेव जयते

It would be easy to see what bearing an analysis of objectives can have on our testing programmes.

The question papers that are now set in our universities tend to conform to a traditional pattern, which leans heavily towards a recall of facts and figures. But they rarely ever explore the student's scale of values and his capacity for independent judgement. If these latter are regarded as important objectives which a student should achieve, it follows that provision should be made for testing the extent to which he has realised them. This inevitably implies that, in every question paper that is set, these objectives are clearly visualised and a specific number of questions are asked which aim at testing the student on each one of these objectives. Our question papers now suffer from a distortion or disproportion. The only proportion they aim at now is to cover some aspects of the subject as prescribed in the curriculum. But they devote too much space to the testing of one or two objectives and hardly any to others which are, it seems to us, even more important. This is why, in a sense, our teaching tends to be dull.

That this is what used to happen in some of the American universities (it probably continues to happen in some of them even today) is borne out by the following paragraphs from a paper by Dr. B. S. Bloom on *Changing Conceptions of Examining at the University of Chicago*: "College instructors have generally thought of their major functions as research and teaching and have regarded examining as a necessary evil which had to be done for the sake of the Registrar and the records. Typically, the final examination for a course was constructed by the instructor a short time before it was needed, and many an instructor stayed up late in the night before the examination to prepare it. As a result, the final examination was likely to be something of a hit-and-miss affair in which favourite questions were repeated and in which the sampling and learning tasks were relatively inadequate. Usually the examination consisted of a number of vague essay questions for which the grading was highly subjective and influenced largely by the quality of the handwriting, the presence of phrases and references the instructor recognised as familiar (usually his own) and by the extent of fatigue and boredom of the instructor at the time he graded a particular paper. Suffice it to say that the grade the student finally received was determined by a tremendous number of accidental and personal circumstances."

Drawing up a good question paper, therefore, is a matter of elaborate thinking and painful toil. It also demands as much imagination as effort. At present, however, it is more or less a repetitive routine for the paper-setter and he keeps on asking the same questions year after year, with minor verbal changes. We may contrast with this what Mr. C. Robert Pace has to say on the evaluation of student progress. (*Improving College Instruction*: pages 97-98): "At first it was thought that a detailed outline of the course content might be a sufficient guide for developing the examination. This proved to be inadequate, however, because the course outlines usually did not suggest clearly the ways in which, and the conditions under which, students' competence in dealing with the course topics could be revealed. Consequently, a specification chart for each examination was required in which the course topics were listed in columns across the top of the sheet and the kinds of behaviour to be observed were listed in rows along the side of the sheet, such as knowledge of facts and principles, ability to draw valid generalisation from data, ability to apply principles to new circumstances, etc. This examination blue-print is carefully developed and serves as a guide for the writing of test questions. The questions are classified on the specification chart to assure that the final product has sampled all the topics and all the objectives. Thus, at the beginning of each year the instructor must prepare a set of specifications for comprehensive examinations, and at the end of each year the Board of Examination reports on the results of the examinations, attempting to identify the strength and weakness in student competence, revealed by various parts of the examinations. By trying to furnish this kind of a mirror to the faculty, and as a consequence of the faculty's attempt to be explicit about what they are trying to do, both Chicago and Michigan State find that there are periodic changes in the specifications, in the examinations, and, more important, corresponding shifts in the curricular materials and the teaching methods in their general courses. The result of evaluation activity is that serious consideration is devoted to thinking about the courses and methods of teaching them, teaching becomes more sharply focussed, and many courses have been completely reorganised."

We envisage this total change in the sphere of our higher education, once our examinations get reformed in this way; and the first reform to be introduced is the specification of the objectives on which students are to be tested. We have dwelt on this at some length because the proposition is so simple as to be almost deceptive about its full import.

ONE can easily see that the nature of examinations exercises a profound influence on the way in which students prepare for them. If students find that examinations call for a mere recall of facts, they take resort to mechanical memorisation. If they realise that they are going to be tested on the application of theories and principles to concrete situations, they will immediately begin to think on those lines. Examinations can thus be used as powerful levers in raising learning, teaching, and indeed, the entire educational process to a higher level of functioning. A statistical analysis of responses to test questions can reflect the strength and weakness of different teaching methods and lead to a critical appraisal and constant improvement of our courses of study. The Boards of Studies should, we think, address themselves to the task of developing a detailed scheme of the specifications or objectives so that the evaluators can properly measure how far students have mastered the competences sought in the course. If students are tested through questions which represent each one of the objectives of the course, a statistical analysis of the results of the examination is sure to mirror faithfully the successes and failures of teachers as well as students, and also fulfil a diagnostic function for students.

We have made it clear in our foregoing remarks that we do not recognise any basic dichotomy between instruction and evaluation (or examinations). In fact, we believe that evaluation is an integral part of education. Any reconstruction of the machinery and instruments of examinations must, therefore, be validated by, and oriented towards at least these fundamental principles :

(a) Examinations should motivate students towards the most valid dimensions of learning.

(b) They should essentially guide the students as well as their teachers in this learning process.

(c) They should uphold academic standards and, at the same time, certify student performance reliably in the light of these standards.

An examination system should thus reflect two dimensions of values. On the one hand, it is a stabilising agency. It sustains and classifies student achievement in the behavioural changes which the educational programme of a university is designed to produce. It recognises the psychology of individual differences and seeks to reconcile this fact with a theory of learning in which goal motivations and learning experiences are made to combine so as to discipline an individual in a wide range of human potentiality. On the other hand, examinations also reflect a philosophy of education which is oriented to a creative and progressive spiral of knowledge and scholarship. There is no ceiling to human understanding, reflection and creativity. If an institution like the University of Chicago, U.S.A., believes in and works towards such a philosophy, it seeks, in effect, to set ever higher goals which, in their turn, provide powerful challenges to the educator to discover even more effective ways and means for the intellectual stimulation of the individual. All this makes instruction and scholarship a dynamic programme. Since a university has to take into account a rather wide range of abilities, it follows that its examination system should contain elements drawn from both these dimensions of values. The mechanics of a progressive examination system should be oriented to certification as well as guidance, to consolidating standards and to motivating a wide range of human potential.

We would now like to set forth our specific recommendations in the matter of examination reform, against this background:

(a) The first great need is to specify the objectives which an academic programme is designed to achieve and to define these objectives in terms of student behaviour. This has to be done for all subjects in conferences and seminars convened on an all-India basis.

(b) A testing programme has to be framed so as to measure the extent of student achievement under each one of these objectives. A question paper should not be hastily improvised. It is a creative as well as a laborious piece of work. It should not be based on an analysis merely of the informational content of a course.

सत्यमेव जयते

(c) It should be possible for the examiner to employ as many kinds of test techniques as are necessary for an evaluation of student achievement *vis-a-vis* the objectives in view. There should be variety and flexibility in an examination system, not rigidity and a dead uniformity. The examiner should have plenty of initiative in shaping his instruments of evaluation. In constructing test papers, we recommend that the following policy be adopted. The Board of Studies concerned should prepare its statement of objectives and define them in terms of student behaviour, after consulting all the teachers of that subject in the colleges affiliated to their university. Secondly, questions for a particular public annual or comprehensive examination should be invited by the Chairman of the Board of Paper-setters for the subject. These questions would constitute a pool reflecting, on the aggregate, the different objectives considered valid by the Board of Studies. (The Committee was divided on the issue of inviting questions from all teachers. The majority, however, were in favour of it.) Thirdly, these should be considered by the Board of Paper-setters. This Board should consist of two or three members drawn from among the teachers in the colleges affiliated to the university concerned and two or three members drawn from among teachers in other universities. Fourthly, the Committee should scrutinise all the questions received (or scrutinise those drawn by the paper-setters themselves if the other procedure is not acceptable) and see that all the objectives of the course are evenly covered by the questions approved and then prepare the final draft of the question paper.

Our instructors and examiners need not commit themselves rigidly either to essay type questions or New Type questions. They should first be familiar with all the test techniques that have been developed in recent years. A quiz can be set on any given course in a class, once a week or fortnight, consisting of short questions demanding pointed answers, testing a student's grasp of his texts or his subject. It need not last for more than half an hour or three quarters of an hour. For a six-weekly examination lasting for an hour, one can use the technique of true-false questions, multiple choice questions of the recognition type, questions which demand completion, matching or re-arrangement and short questions which are in the nature of a recall of facts. Where the student's capacity to apply principles to new situations is to be tested, one can even set open book questions, *i.e.* the student can consult any book he likes, either in the examination hall or in his room, while answering the question, for, in asking such a question, it is assumed that he has already been tested on his grasp of principles. What is to be tested is his capacity to apply those principles to new situations, and this cannot be found in any book. (The situations used should be new altogether.) He has to exercise his own judgement on it. Further, any or all of those techniques can be used by the examiner in public or comprehensive examinations, depending on his judgement as to which particular technique is calculated best to test the student on a given objective. The New Type questions are very useful in testing a student on the various aspects of a course in the shortest possible time. If a student is expected to write an essay type answer in half an hour, he can be expected to answer about ten true-false on multiple choice questions in the same period of time. This means that he can be tested in a wider area of knowledge in half an hour by the New Type technique than by the essay type. Again, where an unusually large number of students are to be tested, the New Type test technique makes for greater reliability and objectivity. As we go higher up and test more advanced students, the essay type will probably be more useful; for it helps to test best the student's power of exposition, argument and expression. The essay type, as is easily seen, will also be necessary at lower levels, when these areas of student behaviour are to be tested. Again, New Type questions will be useful even at higher levels when the coverage of large areas of knowledge is to be tested on. There cannot be any hard and fast rule in these matters, or any advance legislation. Greater freedom and initiative has to be given to the teacher and examiner in trying diverse evaluation procedures of the New Type. We appreciate the difficulties involved in introducing New Type techniques both from the point of view of students as well as teachers and examiners. They have first to be familiar with these techniques in order to use them or to respond to them easily. There should be a phased programme in these matters, a gradual change beginning with the first or preuniversity year in the first instance, in the form of a composite essay and New Type examination.

(d) We also feel that the right kind of test on certain occasions during the academic year will have a highly motivational as well as diagnostic significance. The weekly or fortnightly quiz technique is a fairly effective, if rough-and-ready, instrument to size up students as a group of individual learners in a small area of learning. Given without notice, a quiz can convey to the instructor a more natural profile of a student's cognitive understandings, a profile in repose, as it were, rather than one in artificial ferment. There can be a second type of testing situation in the nature of a six-weekly half-hour examination. A carefully devised test, on the objective pattern, can be employed usefully as a unit test, covering a defined unit of work. A more formal instrument than the quiz, the unit test will be primarily a stock-taking of the conceptual as distinct from the molecular and factual items of knowledge. The purpose in such a test can be to discover integrations, understandings, generalisations, principle-formations and hypothesis-and-theory structures on the basis of the entire unit of work. It will thus be an educational exercise in finding common threads over a six weeks' study and in connecting these threads with the goals of the next unit of work. Then we may lay down a rather formal, terminal, one-hour examination. The terminal examination should aim, not merely at factual recall, but at an initial generalisation of facts into some tentative pattern-structure. It should be a more vigorous attempt at judging the quality of understanding at the inductive level and also the capacity to reflect and apply principles to new situations. Similarly, an annual examination, of three hours' duration, should cover the whole academic year and indicate how well the student has progressed in his field of studies. Finally, there should be a comprehensive examination at the end of the entire course, whether of three or four years. The basic assumption in a comprehensive examination is that it is designed to test a student on all the fundamental skills, competences and understandings which the course is intended to promote in him. The comprehensive test is the best single instrument for a total evaluation of student performance in a whole field of discipline. Though it may be utilised as a general estimate, it can actually show the strength and weakness in the hierarchical structure of an individual's system of knowledge. A programme of comprehensive examinations assumes that very strenuous spade-work has been done in defining the educational objectives in a discipline and that appropriate teaching methods have been employed which make possible the learning-experiences resulting in intended behavioural changes. An examination can be apparently, 'comprehensive' in terms of fallacious objectives and so useless from an educational point of view.

All these examinations—the quiz, the unit test, the terminal, the annual and the comprehensive—fulfil distinct functions and have therefore to be laboriously and carefully designed in order to be valid, each for its own purpose. Otherwise, there is the possibility of duplicating several tests of the same type which will not only defeat the entire educational purpose but, in addition, fatigue students by their mechanical similarity and by becoming too frequent a disturbance in the learning process. Planned properly, these tests will provide adequate motivation for regular work all the year round. At present, we examine students in a manner which enables them to put off work till the end of the year and compels them to cram desparately towards the end.

(e) The various tests administered by college teachers in the course of a year as well as the rest of the work like participation in discussions, seminars and tutorials, and home work like tutorial exercises and term papers should be credited to the extent of 20% of the total marks, subject to supervision by university authorities. That is to say, if a subject carries 200 marks at a public examination (whether it is a public examination earlier than the comprehensive or the comprehensive itself), forty marks should be reserved for all the work mentioned above. Students can be given marks out of forty for participation in discussions, seminars and tutorials during the year. Forty marks can similarly be assigned to tutorial exercises and term papers, if any. (Term papers will figure in special or Honours courses.) Each one of the examinations mentioned above, from the quiz to the annual, will be supposed to carry forty marks for the purpose of this calculation. The average of all the marks that a student gets out of forty under each one of these heads will be set down to his credit under 20% of the marks assigned to that subject in the public or comprehensive examination. If two years have gone without a public examination, 20% of the marks scored under these heads throughout the two years will be counted towards the student's credit in the subject. It should be possible for university authorities to check up any of these records when they feel that there is too large a divergence between the marks obtained by a student in all his college work out of 20% and the marks obtained by him out of 80% of the total in the public or comprehensive examination.

We have suggested a minimum of 20% marks for home and college work to begin with. This can be raised progressively as instructors acquire proficiency in objective evaluation. The reservation of 20% marks for home and college work will itself be a good incentive to regular work by students throughout the year.

(f) Another important question is: Who will examine the students? The typical American approach in this matter is one of entrusting the instructor (the professor and his assistants) with the work of evaluation in the course which he conducts. The traditional modern Indian approach has been to have about 50% external examiners at the lower examinations and about 75% external examiners at higher levels. Some of our universities have also almost exclusively external boards of paper-setters, though the examiners may be internal at the lower examinations. An 'internal' examiner can usually be defined as a member of the faculty in the university in which the examinees are students. An 'external' examiner is a university teacher who teaches in a university other than the one in which the examinees are students. It is, no doubt, erroneous to think that external evaluation ensures reliability. An external examiner is just as much prone to evaluating essay type answers subjectively as an internal examiner is. We should like to state that, as a matter of principle, the responsibility of evaluating the performance of his pupils is the instructor's own and it cannot be denied to him. But we are also aware of the heavy teaching load that an Indian teacher has to bear. Our faculties are hardly able to share all this extra responsibility without a corresponding relief in instructoral and tutorial work. Moreover, for every good teacher who can evaluate his students adequately on their courses, we may run into several poor or even bad teachers in whose hands examinations may prove to be a hazard too great to be risked. The growth of a large number of colleges affiliated to examining universities also makes it impracticable to give examining status to each one of these colleges without a real risk of lowering academic standards. Any sudden change in these matters may result in a sharp decline in scholastic standards. The change will, therefore, have to be a phased programme spread over several years. The present arrangement of a mainly external agency for public and comprehensive examinations need not be disturbed at present. But a beginning can be made by enabling the instructor to rate his pupils on their sessional work and reserving 20% of the marks assigned to the subject concerned for this rating, as has been recommended above. Such a programme of sessional assessment, based on periodic estimates of student performance, is already in use in some of our universities. It serves a dual purpose. It motivates students for more consistent and steady work during the academic year. It also enables the instructor to keep his hand on the pulse of his student group and to see how it responds to his instruction. We recommend that such an evaluation of sessional work by students should be based on concrete evidences rather than general impressions. The instructor will estimate on the basis of a variety of test situations—the quiz, the six-weekly unit test, the open book class examination, term papers, the terminal and the annual. No rigid regulations should be framed and the instructor should have the freedom to decide on the nature of the test he would like to use for sessional assessment. The compromise we have recommended is calculated to bring about an increasing participation by the instructoral staff in the devising of test techniques, and in the evaluation of student achievement, and safeguard the uniform level of academic standards in our universities at the same time.

(g) While considerable objectivity is possible in the assessment through New Type tests, we have no systematic technique for evaluating essay type answers. The essay type question has a definite place in a testing programme especially at the higher levels of university instruction. In point of reliability and validity, as well, the essay type answer tends to be a confused response which we proceed to evaluate in an equally confused and confusing manner. This shows how a vague educational objective can negatively feed back instruction as well as student achievement. The student does not know what abilities he has to develop in the art of writing essay answers. His teachers, who are concerned primarily with subject-matter in a field of knowledge, do not consider it essential to show him how an essay is a model and a medium of communication, presenting disciplinary skills in any branch of knowledge.

We recommend, therefore, that the assessment of essay type answers should be systematically devised in terms of a scoring scheme, detailed by the moderators or head-examiners specifying points expected with regard to subject-matter, structure, design and length. Coherence and emphasis should also be supporting criteria in an assessment of essays. (Proficiency in the use of language, which is a quality related to language skills, need not be insisted upon at least for subjects other than languages during the transitional period in which English continues to be the medium of examination in our universities.) The directions given to examinees should also be clarified to the maximum so that the student and the examiner have little doubt regarding what the student is asked to do. Again, each script should be assessed by two examiners and the average of the two scores taken as a measure of the student's achievement. These are the minimum number of steps that can be taken to make sure of a reasonable measure of objectivity at least in assessing essay type answers. These should be implemented forthwith at least at the B.A., B.Sc. and Honours levels. Some universities have already instituted valuation by two sets of valuers at the M.A. and M.Sc. examinations.

(h) The courses of study for the B.A. and B.Sc. degrees are constituted at present generally as follows :

(i) The required or compulsory courses.

(ii) The major subject or area of specialisation.

(iii) The minor subject or area of study allied to the major one.

(iv) The optional subject which a student chooses from among the courses planned as a part of the general education programme.

The study of these courses may be spread over either two or three years of the university course. In case it is spread over three years, a public examination can be held at the end of each year or once in two years and a comprehensive examination covering the entire course, at the end of the third year. Since the comprehensive examination is to cover the entire course, it will have to include the following :

(i) specific questions on the courses that are covered during the third year; and (ii) questions ensuring an integral study of the entire course covered during the three years.

(i) At the M.A. and M.Sc. level, it is desirable that, although there is a public examination at the end of each year, or a comprehensive examination at the end of the second year, provision should also be made for one of the following alternatives in lieu of two papers: (i) a thesis of 125 pages or 5,000 lines; (ii) or a hitherto unpublished creative work in the field in which the student has specialised, especially the language courses. There is some provision of this kind even now in some of our universities, especially under (i). But it does not seem to function actively. Minor but interesting problems in various fields of study can be taken up for investigation under this provision. This will mean a significant intellectual discipline for students and result, occasionally at least, in useful contribution to knowledge.

(j) The Committee took note of another evil in the existing system of examinations—that of an acceptance, on the part of many examiners, of more evaluation load than they are competent to deal with conscientiously. It is necessary for each university to give some thought to this problem and define the evaluation load in relation to the leisure which a teacher can spare for the purpose. It would be equally desirable for universities to raise the rates of remuneration both for paper-setting and for evaluation so that no teacher is ordinarily tempted to accept a greater evaluation load than he can, in all conscience, accept. We have already pointed out how the construction of a test paper can be a highly arduous and exacting task. A paper-setter may have to spend several days on devising a question paper, if it has to be set on the lines indicated above. If many of the questions are of the essay type at the higher examinations, the examiner may have to spend a good deal of time in order to arrive at a reliable assessment. It is highly desirable that the universities should make it worth while for teachers to undertake this work before they define a teacher's evaluation load in relation to his leisure. Arrangements for getting an essay type script evaluated by two different examiners are equally necessary in the interest of objective evaluation.

(k) Students who fail, or secure a lower class at a public examination than they expected, are in a rather helpless position now in many of our universities. Once a student's performance is assessed, he has no right of appeal. All that he can do is to apply for verification of his mark on payment of certain fees. The Registrar's office then verifies whether the marks assigned to the various answers have been correctly totalled by the examiner. It also makes sure that no answer, or portion of an answer, has been left unassessed. The result is modified if there has been any error under these two heads, and the student is informed accordingly. The question of reassessment does not arise at any stage in this procedure.

But we have already pointed out how the present system of examinations, which leans exclusively on the vague essay type technique and is subject to all the vagaries and moods of the examiner in the process of evaluation, does not have the reliability that ought to justify such a procedure. It is common knowledge that many bright students suffer heavily on this account. We therefore recommend that, till our universities have established a standard of reliability which is undisputed, it should be possible for a student to have his performance reassessed if he feels that his work has not been properly evaluated. The university authorities should get his work reassessed by two other examiners and the average of the two scores should be regarded as the proper evaluation of his performance. The necessary fees to meet these expenses should be collected from the student applicant in question. This is done in the

University of Chicago, U.S.A.

(l) If public examinations are held before the comprehensive examination during the three years of the university course after the pre-university year, they should not act as a deterrent in the student's career or result in his detention in the same class for a year or more. The pre-university test should be a rigorous one, administered in the most scientific way possible, and student performance at this test should be assessed with an extraordinary regard for its reliability and validity. For this is the test which will determine the admissions to a university course. Once the student is admitted, however, it should be optional for him to take the public examinations at any time before the comprehensive examination. The only binding condition should be that he gives satisfaction to the university authorities in these examinations before he sits for his comprehensive examination. As for his own progress during these years, if the student has not taken the public examinations, it should be open to the instructors to detain him in a class, if he has not fulfilled his obligations in terms of academic work which should have been completed during the period.

सत्यमेव जयते

(m) Students who fall ill at the time of the comprehensive examination, or fail in it, should be able to take a make-up examination within three months of that date. They should not have to wait for a year in order to do so. A long period of waiting and of concentration on studies which have already been pursued at length may even permanently affect the personality of the student who has been unfortunate in this regard. Several leading American universities observe this practice.

(n) Then there is the problem of students who are not suited to the areas of study which they have selected for specialisation. This is especially observable in professional courses like medicine, agriculture and engineering. If such students discover, after an exploratory year, that the courses they have selected are against their grain, it should be possible for them to revert to a liberal arts course in the arts or sciences nearest to their field without losing a year. This would be possible if there are summer courses which they can attend after their exploratory year, courses in which they are taught subjects, or portions of subjects, which have been done during that year in the new field of their choice Since we have not recommended detention during any of the years of the university course prior to the comprehensive examination, this will not conflict with any other procedure that we are aware of.

(o) We also recommend that, in measuring the achievement of a student in a public examination, the general average of his performance should be taken into consideration. That is to say, his marks in all the papers, on the basis of which his success or grade (class) is decided, should be totalled up and divided by the number of papers he has taken. Poor performance in one paper or more will not, in that case, affect his final success or grade (class).

(p) It is desirable to administer an orientation test to students within a fortnight of their admission to a university course. This will help the instructor or counsellor to distinguish the areas of the student's ability or preference and also guide the student in his choice of subjects.

(q) For evaluating student performance in the language courses, other than the student's mother tongue or regional language, it is desirable to have an oral test in which his ability to speak the language correctly and with ease can be tested. Some marks should be assigned to this test also in a public examination. This should apply to Indian, Asian and European languages other than English, but not to classical languages. As for English, the test should be held only for students who have taken the optional courses in English.

(r) Finally, we recommend that there should be an evaluation unit in each university. Such units can contribute a great deal towards the building up of a nation-wide movement in the field of examination reform. They can prepare the ground for reorientations, psychometric studies and advisory programmes in each university. They can prepare statistical analyses of results which will serve a diagnostic function and acquaint the student with their strengths and weaknesses in a particular field. We have taken note, while visiting several American universities, of the thoughtful contribution made by testing units in such fields as testing for advance placement, selection for courses, academic guidance and general counselling. Evaluation units have helped several American universities to develop specific policies regarding admission and evaluation. Important studies have also been made on the rates of attrition in professional and liberal arts programmes. In more than one American university visited by us, we found a psychometric expert whose whole-time job it was to advise and assist the faculty in the making of adequate examinations. Such units have the routine duty of studying grade-distributions in course programmes and checking student achievement in a current year with those in previous years.

We therefore recommend strongly that an evaluation or examination unit should be instituted in each university. Besides doing the routine work of test administration, scoring, and publication and analysis of results, such a unit will also be able to attend to test development *i.e.*, assisting paper-setters in various fields to devise questions of the new and old type as well, so as to cover all the objectives of a course), statistical analysis and research and evaluation problems. A unit of this kind usually consists of a director of testing, a psychometrician and some clerical and statistical staff.

IV

IF university examinations aim at an evaluation of the behavioural changes produced in students by the impact of higher education, as indeed they should, it follows that there should also be an all-round change in our courses of study, in the methods of instruction employed in them, and in the facilities made available to students for a closer responsiveness to, and absorption of, the objectives of higher education. Testing programmes are only the end-part of a complex intellectual process. A testing programme has to take the course objectives and the behavioural changes they produce in students into account, and measure the extent to which these have been produced in the student. Our examinations are either a nightmare or a mechanical formality to students today, for the course objectives have not been clearly visualised and, consequently, our syllabi have been framed mainly on the basis of the informational content of a subject. If certain objectives have been obscured in the course of our educational development, it would follow that our courses of study need to be revised so that there can be, once more, a proper distribution and emphasis. It may sound trite to say that the syllabi in each subject should be redrafted, defining, first, the objectives which they are designed to serve, and then devoting to each one of them the space and importance which it demands and deserves. The following can, broadly speaking, be regarded as the objectives which a curriculum in the humanities or social sciences is intended to promote: (a) A knowledge of basic terms, ideas, principles, theories and methods. (b) Comprehension of new technical developments in the field. (c) Accurate observation and recording of phenomena. (d) Formulation of new problems in a manner relevant to the field as also the application of major principles and methods to new problems. (e) Ability to express ideas logically and clearly. (f) Carrying out original research investigations.

A physical science curriculum will naturally have these additional objectives in view:

(a) Skill in using equipment and methods of laboratory research.

(b) Planning new experiments and testing hypotheses.

The philosophy of life and the integral cultural values that the study of a subject is expected to foster; the comparative view of a subject *vis-a-vis* other subjects; a comprehensive grasp of the basic principles and of the techniques and details in the fields of study and the capacity to analyse and set forth clearly and forcefully any of the 'intricate' problems relating to it,—all these objectives will have to be emphasized at each level of university instruction, even as a study of all the aspects of a subject is accomplished gradually and in stages.

Curricula will therefore have to be framed with all these objectives in view. This does not mean that the curricula current today are necessarily unbalanced. It simply means that they have not been framed with these objectives consciously in view and that, if they were to be reconsidered in this light, a great many changes will spontaneously be effected, as has happened in some of the leading American universities.

We have therefore recommended that representatives of all the Boards of Studies in our universities in a subject may be invited to meet together and to revise the syllabi in each subject.

We have to submit a few other recommendations with regard to courses of study. Though they do not quite seem to have a bearing on examinations as such, they are vitally concerned with the entire process of which examinations are a part.

(a) Our courses of study should preferably be planned as half course units, a half course meaning an aspect or portion of a subject that can be covered in the course of a term, two lectures a week (and the consequent tutorial, seminar or preceptorial periods) being devoted to it throughout the term. A half course unit can run throughout the year also at the rate of one lecture a week. In Harvard, for example, an undergraduate has to study 16½ course units or 33 half course units. Half course units, which are generally of terminal duration, make for compactness and for greater variety in the accomplishment of a student. He can then choose portions of a number of subjects that he loves to study in addition to the major field in which he wishes to specialise. A student in Harvard has to take at least six course units in his major field. He has also to take certain required or compulsory courses. There are the language requirements, including English and the study of a foreign language. The language requirement in English generally consists of a test in (a) spelling and grammar (b) vocabulary (c) reading and comprehension and (d) composition. In addition to language requirements, a student has to choose a course unit of study in each one of the following groups in Princeton:—

(a) Arts and literature. (b) History, philosophy and religion. (c) The social sciences. (d) The physical sciences. Obviously, this is the general education programme planned for him. (We would urge that an elementary knowledge of statistics should also be introduced in our syllabi for mathematics in the pre-university or freshman year. It is fast becoming impossible to think without statistics in any field of knowledge.) He has then to choose some course units in his 'minor' subject, which should be a subject related to the area of his major choice. He can also have two optional subjects, that is, two course units in any subject of his choice, or four half course units. It would be clear from this that the division of courses of study into half course units will enable a student to exercise greater preference and choice in his own major field as well as in other fields. The objection may be raised that such a division may call for more teachers than a college has or can afford to have on its staff. But it need not or will not be obligatory on a college to teach all the course units laid down by the university. On the other hand, a college which has the resources can progress better and provide a greater variety of courses for its students.

We saw that this system worked with considerable advantage in several American universities and especially in a field which has been one of the problem fields in Indian universities. Our students, now-a-days, participate eagerly in youth festivals and allied extra-curricular or co-curricular activities. Some teachers even feel that these activities come as a distraction to students in the midst of their curricular work. Many students are eager to participate in them with an eye on the benefits of travel and publicity that these activities bring in their wake. This problem has been faced and, we believe, solved wisely in American universities. These activities are no longer extra-curricular in the United States. The departments of Speech, Drama, Music and Journalism have absorbed them and converted them into strictly curricular activities. A student practising as a debator is given credit for a half course unit by the Department of Speech in U.C.L.A., and other universities and he can also take one or two course units of study under the department, which add considerably to his equipment as a debator. Students who are interested in dramatics take one or two course units of study under the Department of Drama and they can even major with Drama as their subject. Further, the student who plays the role of a hero or any other important character in a play staged under the auspices of the department, college or university, is given credit for a course unit of study. That is, if he is expected to take 33 half course units for qualifying himself for his degree at the end of four years, he is permitted to take only 31 in addition to his enactment of that role. The student who works as director of the stage production of a play also gets due credit for his work. The Professor of Drama sits one hour a week with the student director and evaluates his production. There is a similar arrangement under the Department of Music for the production of an opera. The inclusion of all these activities within the academic framework brings them automatically under university discipline and limits the activities to students who are genuinely interested in cultivating them.

(b) Again, our syllabi have tended to be, more or less, copies of similar syllabi in English or western universities. To the westerner, all knowledge is derived from Mediterranean springs. Till yesterday, at least, the world meant to him the western world and the humanities and sciences are, to him, chiefly western disciplines. We trust that it will not sound parochial if we say that there is no reason why we should continue to take this 'westernised' view of the world of knowledge. Many of these intellectual disciplines are also part of our Indian heritage and it would only be proper to relate them to their Indian origins in an Indian system of education. For instance, the history of economic, political, educational, aesthetic, and philosophic thought need not start for us with Greek thought. It can as well begin for us with Vyasa, Bharata and Kautilya. Several Indian scholars have brought to light the Indian contribution in the field of the various physical sciences. This knowledge has now been mostly confined to the pages of learned journals and to experts in the field. It deserves to be brought down from these rarefied realms into our classrooms and incorporated into our school and college textbooks. This may not make any substantial changes in the body of knowledge that goes under the name of a subject.

But it will certainly give to it a national perspective which is already there and which we have only to recognise and adopt as our own.

(c) It may not be out of place to mention, in this connection, the fact that our students abroad are often unable to enlighten the foreigner with regard to our heritage, for they themselves are not conversant with it, whether in the fine arts or in philosophy. It would be desirable to have a course unit in the development of civilization and Indian culture as a required or compulsory course during the freshman or first year. It may please be recalled in this connection that a student in almost every American university has necessarily to study American history and the American constitution.

(d) A genuinely national and international outlook can also be promoted by instituting courses of study in the South Indian languages in North Indian universities and *vice-versa* and in Asian languages like Japanese, Chinese and Indonesian. Students who wish to study any one of these languages may do so in lieu of Sanskrit, the Prakrits or Persian. Students proficient in the other Asian languages can develop into valuable interpreters of other Asian cultures to our people and also of the impact of ancient Indian thought on these cultures. Classes in these languages and even in languages like Hindi and English should have attached to them, language laboratories equipped with tape recorders and linguaphone machines. Hardly any attention has been paid in the past to correct pronunciation and intonation in the study of a language. That this aspect of language study should be scrupulously cultivated is a fact of paramount importance in the new context in which our country finds itself today. Our language students should be able to speak foreign languages with almost the ease and naturalness of those who speak it as their mother tongue. We frequently tend to speak and study living languages as if they were dead. It would also follow from this, that, when students are tested in language skills, even in Hindi, English or an Indian language other than the speaker's own, there should be a *viva voce* examination following the written test in that language and some credit should be attached to the student's performance in it.

(e) We also think that the provision which has already been made in some of our universities for the submission of a thesis in lieu of two papers or course units at the M.A. stage, should be made to operate more actively and in as many universities as possible. The production of a thesis of this kind will be an excellent intellectual discipline for the advanced student. It is one more way of testing the achievement of the student and it also helps him to cultivate the capacity to carry on research in his own field. We found that in some American universities, the thesis had been replaced by a research course lasting one hour a week with the professor or tutor, or some project of the student's choice, it being immaterial whether a thesis was produced or not at the end of the course. It was also the practice, in some universities, to consider the unpublished creative work of a student, if it was up to the mark, in lieu of a thesis, if his area of study happened to be literature or any other cognate field. The thesis plan or that of recognising unpublished creative work in lieu of it in relevant fields recommends itself to us. The production of thesis in different fields of study on topics which are not stale but meaningful, is bound to be a distinctive cultural contribution.

V

THE examination reforms that we have advocated also presuppose several modifications in the teaching methods prevalent today in our universities. The practice for a long time was to depend almost exclusively on lectures. One of the recent trends has been to supplement lectures with tutorials, though mostly in a half-hearted manner in many colleges. It is necessary to make tutorials the centre of the teaching process and supplement them with lectures, depending upon the subject, if better results are to be achieved.

No doubt, the tutorial method is a highly expensive one. It means that students are to be grouped into threes and fours per tutor and many of our colleges cannot afford this luxury which, in a way, is a necessity. That is why only a few universities in the world can afford to make the tutorial method the central teaching process. But we do not suggest that this should be done at all stages of university instruction. In fact, this is not done even in universities like Princeton in U.S.A. But there are modifications of the tutorial method which can be employed consistently with economy and they are, as a matter of fact, employed for the freshman year in this way even in leading American universities. We have first to determine, in relation to a subject, how much of lecturing is necessary per course per week for the transmission of facts, ideas, principles and theories connected with the subject. The student has, side by side, to continue with his own reading, in his field of study, of such books as are recommended by his teacher. The lecturing may vary from one period to even four periods a week. A method has then to be devised by which the subject is divided into a given number of topics. Each one of these topics can be taken up for discussion, week by week, during the tutorial periods. Under the guidance of the tutor and on the basis of the lectures on the subject and his own reading, the student learns to exercise his own mind on the topics during the tutorial period and to develop his capacity for independent judgement. Needless to say, the lectures are there only to make available to the student the necessary exposition and guidance for understanding his subject. It is during the tutorial periods that he actually grapples with the problems in his field of study and masters them. Course instruction without tutorials can, therefore, hardly result in any substantial benefit to the student. As the Harvard College prospectus puts it: "The course method of instruction is not by itself completely adequate for individualised, non-passive education." (Page 23)

The tutorial system need not be employed in its purest form during the pre-university year. The students in the class can be brought together into small groups of twenty or thirty for class section meetings for discussion of the material assimilated through reading and lectures. Thus in the normal pattern of the larger pre-university courses, there can be one or two lectures and two class section meetings each week for a course unit. These class section meetings can be used for live-language practice also in language courses.

During the first university or 'senior intermediate year', in which the number of students is bound to be smaller than during the pre-university year (or at least about the same), a beginning can be made with another variation of the tutorial system,—that of a 'preceptorial conference'—the method that is employed in Princeton, U.S.A. Woodrow Wilson, as President of Princeton University, was the pioneer in this educational experiment. This pattern is one of one or two lectures (as required) and a preceptorial conference per week in a course unit. The information accumulated by the student from his reading and the class lectures is taken as a basis for the free exchange of the preceptorials. The preceptorials are sure to awaken in him the desire to learn and think independently, for "the free exchange of ideas under the guidance of a preceptor provides stimulation and opportunity for independent thought. The faculty member is present neither to lecture nor test the student's memory nor his ability merely to marshal facts, learned the night before and forgotten the next day. On the contrary, through open discussion in which all are invited to join, the preceptor seeks to encourage each member of the group not only to grasp the subject, but also to evaluate it and its implications in terms of his own critical capacity and experience. For students in the natural sciences and engineering the small laboratory meeting takes the place of the preceptorial conference and provides the natural environment for the interchange of ideas and methods between undergraduate and teacher." (*Undergraduate Education at Princeton, pages 4-5.*)

The preceptorial in Princeton usually numbers seven students. Even there, the method is employed only for some courses of the sophomore or first university year, not all. In many American universities, the small discussion groups are limited only to a few upper class (junior and senior or third and fourth year) courses. For subjects for which it is not possible to employ the preceptorial method in our colleges during the first university year, the class section meetings can continue to take its place. The chief thing is to see that the student completes his study and arrives at the mastery of each course of instruction, topic by topic, in an informal meeting of this kind.

The class section meeting and the preceptorial conference should not be confused with periods during which the home work done by students is returned to them after assessment and after explaining the errors and the corrections needed. If the topic for a given section meeting or preceptorial coincides with the topic set for the home work which is to be returned during such a period, there is no harm if the two coincide. Normally, one should be separated from the other. Even if it is not possible to spare the time for periods during which the home work of a batch of twenty or thirty students is returned and commented on, it will not matter much. Students can take away the corrected exercises at their convenience from the tutor's room. What is vastly more important is the provision for group meetings, class section or preceptorial, in which the student grasps a subject, topic by topic.

During the second or junior university year, the student begins to specialise in a particular field and to embark on a course of genuine independent study. The preceptorial conference should here be the main method of instruction, apart from the lectures. This enables him to have consultation with his tutor in the direction of his independent study. The student now meets regularly with the tutor in his subject in a small group of six or seven. The tutorial work can consist of discussion on the reading done on a given topic in his field, or of problems and results or of essays written by students. The procedure for the senior year can be very much the same, enabling the promising student to meet with the tutor singly, if that is possible. The preceptorial or tutorial group can consist even of ten, if it is not possible to have smaller groups, as happens in the field of the natural sciences in Princeton in post-graduate seminars.

This brings us to the method of instruction to be followed at the post-graduate stage. The procedure at Princeton deserves to be recalled in this connection. "The normal method of group instruction at Princeton is by means of seminars, which consist of a small number of graduate students who meet once or twice a week for a semester with a senior member of the Faculty to study a broad phase of the field in which they are interested...the seminars offered by a Department cover the major divisions of the field by large segments, and the purpose of these seminars, considered collectively, is to open up the subject with a wise combination of breadth and depth...It is assumed that the entering graduate student has a general grasp of his field of study and sees it in relation to other fields. The seminars begin at a suitably advanced level, and they build on a broad base. In economics we find a seminar on "International

Trade", but not one on "Foreign Investment in Central America". In chemistry, one seminar is entitled "Advanced Physical Chemistry" rather than being limited to "Heterogeneous Catalysis". In English, "The Romantic Period" is offered, not "Coleridge's Use of Symbols". Each seminar takes a large area for its province, and the students are guided in the direction of a general mastery by means of extensive reading; through discussion by the professor of main outlines, principles, theories, and problems; and by reports from the students on points of special importance, with the professor as preceptor and critic. At the same time, the students' understanding of the subject is deepened by an intensive investigation of one or two limited topics; the results are sometimes communicated in an oral report, sometimes incorporated in a written paper. In a seminar on "The French Revolution", for example, one student might prepare a study of "The Role of Journalism in the Days of Terror", another a report on "Revolutionary Tendencies in the Writings of Diderot". (*The Idea of a Princeton Graduate Education*, *pages 12-13.*)

The above is an illuminating account of the methods followed in the post-graduate seminars at Princeton. The courses in the natural sciences and in engineering there usually depend more heavily on lectures. At the same time, "considerable provision is made in these Departments for individual, supervised research not connected with seminars, but parallelling them; and advanced work proceeds by seminars through individual consultation".

Seven to ten is about the number of students who should participate in a seminar. There should at least be three seminars for a group during the term. A seminar usually lasts two hours at least. There are, of course, lectures delivered on special topics by members of the faculty, and there are many more lectures delivered for the courses in the natural sciences and engineering in order "to assure a comprehensive treatment of the subject, including an explanation of the necessary body of facts and an exposition of the principal theories which reflect the state of our present knowledge". (*Ibid*, page 13.)

Another phase of the post-graduate programme is concerned with the dissertation that a student has to submit. In the Indian context, this becomes relevant when a student chooses to submit a thesis in lieu of certain papers. "His work is done in close contact with one or more members of the Faculty, who are willing to advise and consult with him as much as he may wish. The chances are that his principal adviser will be working with any one or two other graduate students and that he and his adviser will come to know one another intimately." (*Ibid*, page 14.) This intimate contact between a teacher and his pupil all by himself is the ideal that the tutorial system has always in view.

This method of instruction built around the tutorial system in one form or the other is, in a way, the prerequisite of the examination reforms that we have recommended. Apart from three or four lectures and a section meeting or preceptorial that a student has to attend every day in the course units he has selected for study, he will have to put in three to four hours of work for completing the home work given to him for his section meetings or tutorials. A student's hours of study should range from forty-five to even seventy per week, if he is to work full time as a student. This will come about in a very natural way if this method of instruction is adopted.

Again, the great anxiety of the collegiate teacher today is to "cover all the prescribed portions" in a textbook or subject in his lectures in good time. He covers these portions accordingly. But it is not possible, under existing conditions, to ascertain whether the student also has 'covered', uncovered or grasped them. The tutorial system ensures that this has been done. There is no harm if the teacher confines himself in his lectures, only to an elucidation of difficult points or knotty problems in the prescribed textbooks or subject. In subjects in which not much of an exposition of new theories and principles is called for, the number of lectures delivered can also be reduced and the time utilised for more section meetings or tutorials. In American universities, the work of a faculty member is predominantly tutorial, lecturing being about one-third of his total teaching load. If we utilise our time and man-power in this way, we can expect remarkable results within a very short period of time. Post-graduate students can be employed as tutors if a shortage is experienced in this regard. A great deal of initiative should be given to the heads of departments to organise the courses of instruction in their subject. It would be for them to decide the number of lectures for a course and the number of section meetings, provided they act on the basis that the section meeting or the preceptorial is the centre of the teaching process.

The collegiate teacher has, generally, to be given more privileges and facilities than what have been extended to him so far. We found, for instance, that the teaching load in Harvard was as follows:

Professor—Nine hours a week with credit for committee work and for attending meetings of various university bodies.

Assistant Professor—Ten hours a week with similar credit.

Lecturer—Eleven hours a week with similar credit.

Instructor—Twelve hours with similar credit.

A teacher is promoted on the basis of his research work. This ensures that the teacher does not waste his leisure but uses it for enriching his knowledge in his own field. Teachers who teach integrated courses find it difficult to get the necessary leisure for research work. In such cases, promotion is also given on the basis of effective teaching, measuring the effectiveness by results at the examinations, attendance of students at course instruction and the teacher's own preparation for his lectures.

The summer vacations of teachers are also not their own. They are continually involved in the entire process of higher instruction, from the admission of students to the evaluation of their work. Vast and significant additions are constantly made to each field of knowledge and the teacher, tied to an exacting routine, has not the leisure to be familiar with these developments. In our universities, almost every teacher has to struggle under the weight of extra-curricular assignments which, in other countries, are generally managed by students themselves. The practice in American universities in these matters is worthy of emulation. Each teacher there gets sabbatical leave of one year for seven years of service, six months on full and another six months on half his salary. He can utilise the year for pursuing studies in his own field or for writing books on topics in which he has specialised. Sabbatical leave is not an expensive luxury. It can result in significant contributions to several fields of knowledge. The paucity of research work in our academic circles can be evercome when some such measure is adopted.

There is another activity in which the teacher can make a useful contribution—that of academic counselling. Students need such counselling especially during their first two years in college (the pre-university year and the first year). Thirty freshmen and thirty first year students are attached to an adviser in some of the American universities. The teacher who is assigned this work does four hours of teaching and thirty half-hours or fifteen hours of counselling per week. A junior member of the staff who is in a lower grade is usually assigned this work and he is suitably remunerated for it, ranging from $ 500 to $ 800 per year. The adviser remains in his room during certain stated hours for four days in the week and students see him then and discuss with him their choice of subjects during the first term, their progress in their studies during the second term, and so on. Scheduled appointments are notified if some students do not turn up. Each student in the first two years will thus meet his adviser for half an hour at least six times a term. The remuneration given to the adviser is in addition to his salary and it is equivalent to what another teacher may get if he works for evening classes for remedial courses or for summer courses. Almost each member of the staff receives some such remuneration in addition to his salary and it also acts as an incentive for academic work of a special nature and outside the routine. This very half hour can be utilised in our colleges for academic as well as personal counselling. No such arrangement will be necessary for junior and senior students since they will be in contact with a preceptor or tutor.

सत्यमेव जयते

Teachers can also be useful for conducting remedial courses, either in the evenings during semester days or during the summer vacation, for students weak in a subject or subjects. An orientation test, administered after admission, will help to identify such students. Fees can be charged for this work and the teachers also suitably remunerated.

Introductory courses in the study of several languages and subjects can also be conducted in summer. This would help students to study other subjects or languages in which they are interested, but which do not form a regular part of their semester or term courses. The summer vacations hum with activity in most of the American universities and the attendance that students keep in summer counts, in several universities, towards their regular terms.

Summer courses can also be of use to students who have not fared well in their comprehensive examinations and to those who were ill when the examinations were on. Such students can take a make-up examination after attending these courses.

There is also some attrition, which is avoidable, in the engineering and other professional courses. Certain students find, at the end of a year, that these courses are against their grain. It should be possible for such students to revert to a liberal arts course, in that field of the physical sciences which is the nearest to theirs, after attending summer vacation courses in the subjects concerned and without losing a year. Portions of these subjects, done during the preceding academic year, can be taught as part of these summer courses. They would have normally been undisturbed had they not taken to the professional course. They can be permitted to join the final year class on the basis of a test administered at the end of the summer courses.

New reading materials have also to be made available to students. It is not practicable to expect all students to reach out to heavy tomes in the library to get at basic documents or publications related to their subject. If only the university Boards of Studies could plan and publish inexpensive source-books for each subject, a good deal will have been achieved. In history, for instance, one can think of a source-book containing original texts of historic treaties, inscriptions and proclamations concerned with the period in question. Books of this kind on each subject will stimulate independent thinking on the part of students and give them a sense of living with their problems, instead of viewing them through the spectacles of one interpreter or another, however gifted.

VI

WE have, in conclusion, to make a few general recommendations which are expected to tone up the entire educational process in one detail or the other.

1. The library facilities in many of our colleges are woefully inadequate. More often than not, books are safely locked away from students in our college libraries. Many of our college libraries are open only during college hours, the very time when students are busy attending college lectures. It is necessary to keep them open for longer hours each day,—say from 9 a.m. to 11 p.m. The student should be encouraged to regard the library as the scene of many of his intellectual discoveries. Apart from the main library, there should be independent rooms for each subject or group of subjects, in which books are arranged, not necessarily according to a recognised library system, but the convenience of students. For instance, a student of English literature should be able to find all the books on aesthetics or on literary criticism arranged together, and the works of an outstanding author along with all the available critical writings about him. This may encourage a student to read, on a given topic, books that he may not have heard of but which it would be well worth his while to read.

2. Examinations loom large on the horizon of the Indian student for yet another reason,—the significance that they have for his employment after graduation. We were filled with admiration for what is being done in American universities by way of vocational guidance. In a highly industrialised society, there naturally is a closer contact between educational institutions and large industries. The industries spend enormous amounts on establishing research

centres and industrial corporations are frequently on the look-out for the best talent in the university. The director of counselling in a university can thus do a great deal to fix up outgoing students in suitable jobs. The State and Federal Governments also pay continual attention to this problem. The U.S. Department of Labour, for instance, has published a dictionary of occupational titles in two volumes, giving estimates of Worker Trait Requirements for four thousand jobs. Apart from scholarships and free-studentships awarded to students, part-time jobs are found for hundreds of them in each university, at the rate of $ 1.50 an hour and even full time work during the summer vacation. In colleges like Antioch and Beria, a student has compulsorily to work in a job of his choice. Later, the university authorities help him to settle down to the profession of his choice. We suggest that a few posts in the clerical and other lower cadres may be kept vacant in each college and that the work relating to them may be distributed annually, on a part-time basis at the rate of two or three hours per student. Part-time work of this kind will hearten a poor student by giving him a sense of financial independence. Senior students can also be employed as tutors in hostels and as secretaries to heads of departments in colleges. There is need for such secretaries at least in the larger departments in colleges, as in American universities.

3. We found in American universities and in academic circles a great concern for identifying the abler or superior student. The need for more efficiency in the field of physics and of space rockets, stressed by recent events, has only served to focus the attention of the country on the entire question of identifying the able student and doing everything for him to enable him to rise to his full stature. A committee representative of leading American universities has been busy collecting the statistics and the views of experts on this question. Needless to say, it is to the able students that the country will have to look for leadership

tomorrow. Many more State and Federal scholarships should, we think, be made available to able students in our universities at undergraduate as well as post-graduate levels. We would also like to recommend the adoption of a practice by which the most outstanding graduate of a university is recognised as a student worthy of representing India in his field during the year. An accredited university is requested every year in America to recommend its most outstanding student on the basis of his academic attainments, character and other activities during the year. The records of students who are recommended in this way are duly considered by a committee and students who are approved receive the Phi Beta Kappa keys for the year. This is regarded as the highest prestige that a student can attain in the country. We recommend that a detailed scheme be devised in this regard and made to operate under the auspices of a body like the University Grants Commission or the Inter-University Board. It should also be possible to devise special programmes of study for the able student.

4. The practice of maintaining a docket on each student, giving full details of his performance in the various tests, in the home-work assigned to him and the credit earned by him in it as also of his extra-curricular activities, has appealed to us greatly. In fact, dockets giving similar information about the high school career of a student are received in American universities while considering fresh admissions every year and, along with the student's performance in the entrance test and the recommendation of the head master, they constitute valuable evidence on the basis of which admissions are effected. The maintenance of such dockets will help college authorities to watch a student's progress from year to year. If copies of these dockets are made available to chairmen of departments and to advisers, as is done in American universities, they can guide students more effectively.

5. The medical and psychiatric services available to students in many American universities have made us aware of the big gap in this regard in many of our institutions. We do not suppose that there is such a need for psychiatric services in our universities. But medical service is essential and it should be made available not merely in a formal but in quite a substantial measure.

6. Admissions are considered and effected in a very elaborate manner in the American universities. Members of the selection committee of a university go round the schools in their area months before the commencement of the first term and interview the students who are likely to apply for admission. The school records of students are considered along with their scores in the achievement tests and applicants to some universities at least have to take certain aptitude tests. The selection committee is busy about admissions at least from January to May each year. We will have achieved something in this direction if we make sure that our school-leaving examinations are sufficiently objective and if the results are published at least a month before colleges re-open for the new academic year in States in which they are not published early.

We have tried to include in the Report whatever we thought had a vital bearing on the situation in our own universities relating to examinations and to other phases of higher education which had a direct or indirect bearing on examinations. We have resisted the tendency to admire everything new, simply because it was new, and to register every impression, however trivial it might have been. One of us thought, for instance, that classrooms in American universities offered a good solution to the problem of 'ghost' voices in classes when attendance is taken. Any student can say "Present" or "Yes, sir" when the teacher calls out a number and, in a big class, it is frequently hard for the teacher to distinguish whether the student in question answers for his own number or for somebody else's. This problem does not arise at all in American classrooms. All the chairs for students have consecutive numbers prominently painted on them and students have to sit according to their numbers. The teacher or monitor notes down the numbers of empty chairs in a minute and the absentee slip is, later, handed over to the office. But nearly six to seven minutes out of a period of fifty or fifty-five minutes are spent in a big class in ascertaining the numbers of absentees each day. But we have not raised this impression to the status of a recommendation. Again, in Princeton and a few other universities, there is the 'Honor system' which applies to written examinations and tests. "By its terms, undergraduates accept *full* responsibility for their conduct in written examinations and faculty members leave the room. The Honor system makes the student responsible on two counts: first, that he neither give nor receive aid during examinations, and, second, that he report any observed violations of this code .... An infraction is reported to the Undergraduate Honor Committee which undertakes its own completely confidential investigation and submits its recommendation directly to the faculty. The penalty for violation of the honor system is immediate and irreversible dismissal from the university." (Page 59, *Undergraduate Education at Princeton.*) But we have not recommended the adoption of this system because, obviously, it is not just an administrative or reorganisational measure but an index of the sense of moral responsibility towards which the student community evolves in its own full awareness. We believe that our recommendations are practicable and that, if they are adopted and implemented, they will result in beneficial reform in our examination procedures and, indeed, in the entire process of higher instruction in the country.

SUMMARY OF RECOMMENDATIONS

1. The first step to take in the matter of examination reform is to get the representatives of all the Boards of Studies in Indian Universities in each one of the subjects of study to meet together in conference for formulating course objectives and for defining them in terms of student behaviour.

2. Our question-papers are now mainly based on an analysis of the informational content of a subject. But there should be a specific number of questions in each paper which aim at testing the student on each one of the course objectives. Evaluation must be regarded as an integral part of education.

3. The examiner should have plenty of initiative in shaping his instruments of evaluation. He should be familiar with and also free to employ as many kinds of test techniques as are necessary for an evaluation of student achievement under the objectives in view,—the quiz, true-false questions, multiple choice questions, questions which demand completion, matching or re-arrangement, open book questions, short questions which are in the nature of a recall of facts and essay type questions.

4. For a public or comprehensive examination, the chairman of the board of paper-setters should invite questions on the subject from all the teachers of the subject in the colleges affiliated to the university concerned. Where this is not favoured, each one of the paper-setters should draw questions calculated to test the student on all the course objectives.

5. A board of paper-setters should consist of two or three members from among the teachers of the subject in the colleges affiliated to the university and two or three members drawn from among teachers in other universities. They should see that all the objectives of the course are evenly covered by the questions approved.

6. There is bound to be difficulty in the introduction of test techniques of the New Type. There should be a phased programme in these matters, beginning with the first or pre-university year, in the form of a composite essay and New Type examination.

7. There should be different kinds of tests held throughout the year. They will have motivational as well as diagnostic significance. We recommend the weekly or fortnightly quiz, a six-weekly half-hour test, a terminal one-hour examination and a three-hour annual examination. We also recommend a comprehensive examination at the end of the entire course. All these tests and examinations have *distinct* functions which are defined in the Report. They will defeat the educational purpose, if they are all of the same type.

सत्यमेव जयते

8. The various tests administered by college teachers in the course of a year as well as the rest of the work like participation in seminars, discussions and tutorials and home work like tutorial exercises and term-papers should be credited to the extent of 20% of the total marks, subject to supervision by university authorities.

9. As a matter of principle, the responsibility of evaluating the performance of his pupils is the instructor's own. But the present arrangement of a mainly external agency for public and comprehensive examinations need not be disturbed at present.

10. The assessment of essay type answers should be

systematically devised in terms of a scoring scheme detailed by the moderators. Each script should be assessed by two examiners and the average of the two scores taken as a measure of the student's achievement.

11. A comprehensive examination, since it is to cover the entire course, should include the following questions:

(i) Specific questions on the courses that are covered during the third year, and

(ii) Questions ensuring an integral study of the entire course covered during the three years.

12. At the M.A. and M.Sc. level, provision should be made for one of the following alternatives in lieu of two papers:

(i) A thesis of 125 pages or 5,000 lines; or

(ii) a hitherto unpublished creative work in the student's special field, especially in the language courses. There is provision of this kind in some universities even now under (i).

13. The evaluation load of a university teacher should be defined in relation to the leisure which he can be expected to spare for the purpose. But the universities also should raise the rates of remuneration both for paper-setting and for evaluation.

14. A student examinee has, at present, no right of appeal even if he feels that he has done better at a public examination than what is reflected in his results. Our examinations do not have the kind of reliability that ought to justify such a procedure. The university authorities should get the scripts of such a student applicant, on payment of

fees, reassessed by two other examiners. The average of the two scores should be regarded as the proper evaluation of such a performance.*

15. Extraordinary care should be taken regarding the validity and reliability of the pre-university test. Once the student is admitted, it should be optional for him to take the public examinations at any time before the comprehensive examination. The only binding condition should be that he passes these examinations before he appears for the comprehensive examination and fulfils all his obligations regularly in his college in terms of academic work.

16. If students of professional subjects discover after an exploratory year that the courses which they have selected go against their grain, it should be possible for them to revert to a liberal arts course in the arts or sciences nearest to their field, without losing a year. This would be possible if there are summer courses which they can attend in these subjects.

17. The general average of a student's performance should be taken into consideration while measuring his

---

*There is some difference of opinion regarding Recommendation No. 14 in the summary of recommendations. Dr. F. C. Auluck, opines: "I think that, as it stands, it will create a number of complications. On a complaint by a student examinee the scripts should be referred to the Head of the Department of that subject in the University and if he thinks that the scripts need revaluation, then these should be reassessed by another examiner, without payment of any fees." Dr. S. Misra remarks: "It may be conceded that, in some cases, the valuation of an examination script has not been such as the script deserves. Justice demands that there should be a revision on appeal. But though theoretically this is all right, such a provision will lead to endless troubles and administrative difficulties. The results will be challenged in innumerable cases leading to unfortunate situations. In my judgement, we should not make this recommendation." The other members have accepted it.

achievement in a public examination.

18. It would be desirable to administer an orientation test to students within a fortnight of their admission to a university course.

19. It would be desirable to have an oral test in language courses, in languages other than the student's own mother-tongue or regional language. This would make it possible to test the student's ability to speak the language correctly and with ease. Some marks should be reserved for such a test in a public examination. This need not be made applicable to classical languages. As for English, the test should be held only for students who have taken up the optional courses in English.

20. There should be an evaluation unit in each university. Besides doing the routine work of test administration, scoring and publication and analysis of results, such a unit will also be able to attend to test development, statistical analysis and research and evaluation problems. A unit of this kind usually consists of a director of testing, a psychometrician and some clerical and statistical staff.

21. Some recommendations have also been made with reference to the framing of curricula in universities, as examinations, as the end-part of the educational process, are also bound up with other aspects of higher instruction:

(a) Curricula should be framed with all the course objectives in view.

(b) The courses of study should preferably be planned as half course units. They will make for compactness and for greater variety in the accomplishment of a student. They will also enable students to exercise greater preference and choice in their own major field as well as in other fields. This will also help to bring cultural activities like Debates, Dramatics and Music within the academic framework and automatically under university discipline.

(c) An elementary knowledge of statistics should also be introduced in our syllabi for mathematics in the pre-university or freshman year. It is fast becoming impossible to think without statistics in any field of knowledge.

(d) It would be proper to relate the various fields of study to their Indian origin. There is no reason why the history of thought in a particular field should start only with Greek thought. We should adopt, for all these fields of knowledge, the national perspective which already exists.

(e) A course unit in the development of civilization and Indian culture should be introduced as a compulsory course during the pre-university or first year.

(f) Courses of study in the South Indian languages should be instituted in North Indian universities and *vice versa,* and also in Asian languages like Japanese, Chinese and Indonesian. Classes, in these languages and even in languages like Hindi and English should have attached to them phonetic laboratories equipped with tape-recorders and linguaphone machines. Hardly any attention has been paid in the past to correct pronunciation and intonation in the study of a language.

22. We also wish to make certain recommendations regarding teaching methods, university teachers and teaching materials —

(a) It is necessary to make tutorials the centre of the teaching process and supplement them with lectures, rather than follow the reverse method. The tutorial method is a highly expensive one. But, as in the United States, it can be applied with modifications at various stages,—the class section meeting in the pre-university year and first year and the preceptorial conference during the second and third year. The tutorial method should not be confused with the periods during which the home-work of students is returned after assessments. Seminars should be the chief method of instruction for the post-graduate course. All these terms have been defined in the Report. The student who chooses to write a thesis in lieu of two papers will see his adviser all by himself.

(b) The number of lectures per week can be reduced and the number of tutorials increased. This will do away with the anxiety to cover all 'prescribed' portions in one's lectures. In American universities the work of a faculty member is predominantly tutorial, lecturing being about one-third of his total teaching load.

(c) The normal work expected of a teacher and the procedure regarding his promotion should also be properly defined.

(d) Sabbatical leave of one year for seven years of service, six months on full and another six months on half the salary, should be given to our university teachers, as in American universities.

(e) Academic counselling should also be introduced in our colleges and teachers suitably remunerated for it. A teacher who does this work has four hours of teaching and thirty half-hours of counselling per week in American universities.

(f) Teachers can also be useful for conducting remedial courses in the evenings or during the summer vacations. Introductory courses in the study of several languages and subjects can also be conducted in summer. These will be of use to students who have not fared well in their examinations and to those who wish to study other subjects or languages. Even the attendance that students keep in summer counts, in several American universities, towards their regular terms. Teachers should be suitably remunerated for all this work. Summer courses will also be of use to students who wish to change over from the engineering and other professional courses.

(g) New teaching materials have to be made available to students,—inexpensive source-books for each subject.

23. We have also to make a few general recommendations:

(a) Better library facilities have to be made available to students.

(b) Students should be given vocational guidance. A few clerical and other posts should be kept vacant in each college and the work relating to them should be distributed annually, on a part-time basis, at the rate of two or three hours per student. Each poor student should be paid for this work.

(c) A detailed scheme should be devised for identifying the best university students and for recognising them on an all-India basis. Many more scholarships and fellowships should also be made available to the abler students.

(d) The practice of maintaining a docket on each student, giving full details of his performance in the various tests year by year, of the credit earned by him in his home-work and also of his extra-curricular activities, appeals to us greatly. If copies of these dockets are also made available to teachers, they can guide students more effectively.

(e) There should be an effective medical service for students.

(f) The results of the school-leaving examinations should be published at least a month before colleges reopen for the new academic year.

Signed by all the members of the
Examinational Reform Project Committee.

सत्यमेव जयते

APPENDIX I

THE COLLEGES, UNIVERSITIES AND OTHER EDUCATIONAL INSTITUTIONS VISITED SINGLY OR COLLECTIVELY BY MEMBERS OF THE COMMITTEE IN U.S.A.

1. Princeton University, Princeton, N.J.
2. Institute of Advanced Study, Princeton, N.J.
3. Education Testing Service, Princeton, N.J.
4. State University of New York, Albany, N.Y.
5. Harvard University, Cambridge, Mass.
6. Boston University, Boston, Mass.
7. Boston College, Boston, Mass.
8. Brandeis University, Waltham, Mass.
9. Massachusetts Institute of Technology, Boston, Mass.
10. Tufts University, Medford, Mass.
11. Newton College of Sacred Heart, Newton, Mass.
12. Newton High School, Boston, Mass.
13. Lexington School, Boston, Mass.
14. Rindge Technical High School, Cambridge, Mass.
15. University of Rochester, Rochester, N.Y.
16. Antioch College, Yellow Spring, Ohio.
17. Wayne State University, Detroit, Mich.
18. Central Michigan College, Mt. Pleasant, Mich.
19. University of Chicago, Chicago, Illinois.
20. De Paul University, Chicago, Illinois.
21. Northwestern University, Evanston, Illinois.
22. Chicago City Junior College, Chicago, Illinois.
23. Science Research Associates, Inc., Chicago, Illinois.
24. Cranbrook School of Bloomfield Hills, Michigan.
25. Yerkes Observatory, Williams Bay.
26. University of Maryland, College Park, Maryland.
27. Middlebury College, Vermont.
28. University of Utah, Salt Lake City, Utah.
29. Inter-Mountain Indian School, Brigham City, Utah.
30. San Francisco State College, San Francisco, Calif.
31. Mill's College, Oakland, Calif.
32. Stanford University, California.
33. University of California, Berkeley, Calif.

34. Schaeffer's School of Colour and Design, San Francisco.
35. South California University, Los Angeles.
36. University of California, Los Angeles.
37. Pomona College, Claremount, California.
38. Dr. Tyburg's East West Cultural Center, Los Angeles.
39. University of New Mexico, Albuquerque, New Mexico.
40. The Ohio State University, Columbus, Ohio.
41. Berea College, Berea, Kentucky.
42. Columbia University, New York, N.Y.
43. Yale University, New Haven, Conn.
44. Pennsylvania University, Philadelphia, Penn.
45. Swarthmore College, Swarthmore, Penn.
46. Pittsburgh University, Pittsburgh, Penn.
47. Indiana University, Bloomington.
48. Purdue University, West Lafeyette, Indiana.
49. Notre Dame University, South Bend, Indiana.
50. St. Mary's College, South Bend, Indiana.
51. Butler University, Indianapolis.
52. California Institute of Technology, Pasadena.
53. Associated Colleges, Claremont, California.
54. University of Illinois, Champaign, Urbana.
55. Barat College, Lake Forest, Illinois.
56. Kansas State College, Manhattan, Meninger Foundation, Topeka.
57. Washburn University, Topeka.
58. St. John Fisher College, Rochester, N.Y.
59. Admissions Office, Buffalo University, Buffalo, N.Y.
60. Fordham University, New York, N.Y.
61. Columbia University, N.Y.
    - (i) Office of Admissions, Teachers' College.
    - (ii) College Entrance Examination Board.
    - (iii) Psychological Corporation, N.Y.
62. Gennassio Teachers' College, N.Y.
63. Christian University, Fortworth, Texas.
64. Century College, Shreveport.
65. Atlanta University, Atlanta, Georgia.
66. Morehouse College, Atlanta, Georgia.
67. Emory University, Atlanta, Georgia.
68. Kingwood Girls' School, Bloomfield Hills, Detroit, Mich.
69. Mt. Pleasant Senior High School, Michigan
70. Rosebush Elementary School, Michigan.
71. Loyola University, New Orleans, La.
72. Xavier University, New Orleans, La.
73. Newton Country Day School, Newton, Mass.
74. New Havens State Teachers' College, Connecticut.

75. Yellow Springs Elementary School.
76. Yellow Springs High School.
77. The Fels Institute of Research, Yellow Springs.
78. The Antioch Elementary School.
79. New Trier High School, Winnetka.
80. Skokie Junior High School, Winnetka.
81. The Crow Island Elementary School, Winnetka.
82. Centre for the Study of the Behavioural Sciences, Paulo Alto.
83. Foundation School, Beria.

सत्यमेव जयते

APPENDIX II

A LIST OF MANY OF THE EDUCATORS AND EDUCATIONISTS WITH WHOM THE MEMBERS OF THE COMMITTEE DISCUSSED EXAMINATION REFORMS AND THE PROBLEMS OF HIGHER EDUCATION GENERALLY.

1. Mr. Donald Edgar,
Director,
International Educational Exchange Service,
Washington, D.C.

2. Dr. A. S. Adams,
President,
American Council on Education,
Washington, D.C.

3. Dr. Francis J. Brown,
Director,
Committee on Leaders and Specialists,
A.C.E., Washington, D.C.

4. Dr. Frederick R. Mangold,
Assistant Director,
C.L.S., A.C.E.

5. Dr. A. A. Hauck,
Director,
International Center,
Washington, D.C.

6. Dr. Paul E. Smith,
National Education Association,
Washington, D.C.

7. Dr. Frank L. Silver,
U.S. Office of Education,
Washington, D.C.

सत्यमेव जयते

8. Mr. Paul Bodenman,
U.S. Office of Education,
Washington, D.C.

9. Mr. C. William Edwards,
Director of Admission,
Princeton University, N.J.

10. Dr. Richard D. Challener,
Secretary of the Faculty Board of Advisers,
Princeton University.

11. Dean J. Douglas Brown,
Dean of the Faculty,
Princeton University.

12. Dean Jereniah S. Finch,
Dean of the College,
Princeton University.

13. Mr. Armstrong,
Assistant Dean,
Graduate School,
Princeton.

14. Prof. Philip K. Hitti,
Dept. of Oriental Studies,
Princeton University.

15. Dr. William S. Dix,
University Librarian,
Princeton University.

16. Mr. W. Thorp,
Prof. of English Literature,
Princeton University.

17. President Robert F. Goheen,
Princeton University.

18. Prof. James I. Armstrong,
Asst. Dean of the Graduate School,
Princeton University.

सत्यमेव जयते

19. Dean Howard Menand Jr.,
Asst. Dean of the School of Engineering,
Princeton University.

20. Mr. Henry S. Dyer,
Vice-President,
Educational Testing Service,
Princeton.

21. Mrs. Anne Smith, E.T.S., Princeton.

22. Mr. Valley, E.T.S., Princeton.

23. Mr. Harvey, E.T.S., Princeton.

24. Mr. Solomon, E.T.S., Princeton.

25. Mr. Levine, E.T.S., Princeton.

26. Mr. Ebel, E.T.S., Princeton.

27. Mr. James E. Allen,
President of the University of the State of New York and Commissioner of Education.

28. Dean Jarvis,
State University of New York.

29. Dr. Frederick B. Morse,
Secretary,
Board of Regents of the State of New York.

30. Dr. Hugh M. Flick,
Executive Asst. to the Commissioner,
State Dept. of Education,
Albany, N.Y.

31. Dr. Muirhead,
State Dept. of Education,
Albany, N.Y.

32. Mr. Sargent Kennedy,
Registrar,
Harvard University,
Cambridge, Mass.

33. Prof. I. A. Richards, Harvard University, Cambridge, Mass.

34. Dr. Miss Gibson, Harvard University, Cambridge, Mass.

35. Walter J. Bate,
Prof. of English, Harvard University, Cambridge, Mass.

36. Mr. Herzog, Asst. Dean of Examinations,
Harvard University, Cambridge, Mass.

37. Dr. Dean Kay Whitla,
Director of the Office of Tests,
Harvard University, Cambridge, Mass.

38. Dr. Dona Lyda Farmsworth,
Director of University
Health Services, Harvard University, Cambridge, Mass.

39. Mr. David D. Henry,
Director of Admissions, Harvard University, Cambridge, Mass.

40. Mr. Arthur D. Trotenbergh,
Asst. to the Dean of the
Faculty of Arts and
Sciences, Harvard University, Cambridge, Mass.

41. Mr. John B. Fox,
Director of Overseas Relations, Harvard Univ., Cambridge, Mass.

42. Dean Robert B. Watson,
Associate Dean of Harvard College, Cambridge, Mass.

43. Mr. Joseph Young, Harvard College, Cambridge, Mass.

44. Prof. Buochner,
Massachusetts Institute of Technology, Mass.

45. Dr. R. Anderson,
Education Dept., Cambridge, Mass.

46. Mr. Raymond M. Blaisdell,
Lecturer on Education, Harvard Univ., Cambridge, Mass.

सत्यमेव जयते

47. Dr. Robert H. Anderson,
Lecturer in Education, Harvard Univ., Cambridge, Mass.

48. Mr. R. Raymond Rogers,
Newton High School, Cambridge, Mass.

49. Mr. Robert Ulich,
Prof. of Education, Harvard Univ., Cambridge, Mass.

50. Mr. P. J. Rulon,
Prof. of Education, Harvard Univ., Cambridge, Mass.

51. Mr. Poirier,
Lecturer in English, Harvard Univ., Cambridge, Mass.

52. Mr. Brainerd A. Thresher,
Director of Admissions,
Massachusetts Institute of Technology,
Boston, Mass.

53. Mr. Donald L. Oliver,
Director of Admissions,
Boston University,
Boston, Mass.

54. Dr. Edwin H. Sauer, Lecturer in Education,
Harvard University, Cambridge, Mass.

सत्यमेव जयते

55. Prof. Fletcher Watson,
Professor of Education, Cambridge, Mass.

56. Dr. John B. Carroll, Professor of Education,
Graduate School of Education, Cambridge, Mass.

57. Mr. Grant E. Curtis,
Director of Admissions,
Tufts College, Medford, Mass.

58. Nils Yugve Wessell,
President,
Tufts University, Medford, Mass.

59. Dr. Robert B. Stewart,
Dean of the Fletcher School of
Law and Diplomacy, Tufts University.

60. Mrs. Marshall, Tufts University.

61. Prof. Wallace Drew,
Director of Financial Aid, Tufts University.

62. Dean Charles Stearns, Tufts University.

63. Mr. Joseph Stanley Comidar,
University Librarian, Tufts University.

64. Rev. Charles F. Dononan,
Professor of Education,
Boston College, Boston, Mass.

65. Dr. John J. Walsh,
Director of Testing,
Boston College, Boston, Mass.

66. Mr. Gabrielle Husson,
President, Newton College of Sacred Heart, Newton, Mass.

67. Dean, Newton College of Sacred Heart, Newton, Mass.

68. Foreign Student Adviser,
Brandeis University, Waltham, Mass.

69. Mr. Philip J. Driscoll,
Director of Admissions,
Brandeis University.

70. Dr. John G. Bowker,
Dean of the Faculty,
Middlebury College, Vermont.

71. Mr. Egbert C. Hadley,
Chairman of the Board and
President of the Corporation, Middlebury College, Vermont.

72. Dr. Douglas Stowe Beers Hudson,
Prof. of English Literature,
Middlebury College.

73. Dr. Howard M. Munford,
Prof. of American Literature,
Middlebury College.

सत्यमेव जयते

74. Mr. John T. Andrews,
Asst. Prof. of Philosophy,
Middlebury College.

75. Mr. Robert H. McCambridge,
Administrative Secretary,
University of Rochester, N.Y.

76. Director of Testing,
Rochester University, N.Y.

77. Mr. Charles R. Dalton,
Director of Admissions and
Student Aid, Rochester University, N.Y.

78. Mr. Joseph W. Cole,
Asst. Dean of Students, Rochester University, N.Y.

79. Dr. Edward C. Cieslak,
Director of Admissions,
Wayne State University,
Detroit, Michigan.

80. Miss Marybelle Boyle,
Supervisor of Testing,
Wayne State University.

सत्यमेव जयते

81. Dr. Stanford H. Glazer,
Counselling Director,
Educational Center, Michigan.

82. Mr. Harry Hoey,
Head Master, Crambrook School, Michigan.

83. Mr. Bruce N. Coulter, Crambrook School, Michigan.

84. Mr. Snider, Crambrook School, Michigan.

85. Mr. Finlay Carpenter,
Asst. Prof. of Education, Univ. of Michigan, Ann Arbor,
Michigan.

86. Miss June Shoup, Secretary.
English Language Institute, Univ. of Michigan, Ann Arbor,
Michigan.

87. Mr. Warner,
Testing Service, Univ. of Michigan, Ann Arbor, Michigan.

88. Mr. James Robertson,
Asst. Dean, Univ. of Michigan, Ann Arbor, Michigan.

89. Mr. Frank Womer,
Asst. Prof. of Education, Univ. of Michigan, Ann Arbor, Michigan.

90. Mr. John Millholland,
Chief, Evaluations Division, Univ. of Michigan, Ann Arbor, Michigan.

91. Mrs. Goedell, Foreign Students Section,
Univ. of Michigan, Ann Arbor, Michigan.

92. Dr. Geer,
University Hospital, Univ. of Michigan, Ann Arbor, Michigan.

93. Dr. Norman E. Nelson,
Prof. of Philosophy, Univ. of Michigan, Ann Arbor Michigan.

94. Dr. Richard T. Doney,
Asst. Dean, Northwestern University,
Evanston, Illinois.

95. Mr. R. G. Stern,
English Literature Dept.,
University of Chicago.

96. Dr. Benjamin Bloom, University Examiner,
University of Chicago, Illinois.

97. Prof. Norman Maclean, Univ. of Chicago Illinois.

98. Dr. Max D. Engelhart, Director,
Dept. of Examinations, Chicago City Junior College.

99. Dr. Durham, Academic Dean,
University of Utah, Salt Lake City, Utah.

सत्यमेव जयते

100. President A. Ray Olphin, President,
University of Utah, Utah.

101. Dr. William Mulder,
Prof. of American Literature, Univ. of Utah, Utah.

102 Mr. Ghisalin Brewster,
Professor of English, Univ. of Utah, Utah.

103. Mr. Thomas Tommansy,
Supt., Inter-Mountain Indian School,
Brigham City, Utah.

104. Dr. Leo F. Cain,
Vice-President,
San Francisco State College, California.

105. Dr. John T. Palmer,
Coordinator of Advising, California.

106. Dr. F. Grant March,
Coordinator of Testing, California.

107. Dr. Shepard Insel,
Coordinator of Counselling Center, San Francisco State College, California.

सत्यमेव जयते

108. Dr. George C. Feliz,
Coordinator of Graduate Study, San Francisco State College, California

109. Director of Admissions,
Mill's College, Oakland, California.

110. Mr. Dwight B. Adams,
Assistant Business Manager, Stanford University.

111. Mr. John D. Black, Director,
Counselling and Testing Center, Stanford University.

112. Mr. R. Dudley Boyce,
Director of Ilacement, Stanford University.

113. Elva Fay Brown, Dean of Women, Stanford University.

114. Mr. William G. Craig, Dean of Women, Stanford University.

115. Mr. Harry L. Sanders,
Associate Director of Planning, Stanford University.

116. Mr. Rixford K. Snyder,
Director of Admissions, Stanford University.

117. Mr. Ronald B. Bracewell,
Associate Prof. of Elec. Engineering, Stanford University.

118. Mr. Leon Festinger,
Prof. of Psychology, Stanford University.

119. Mr. Edwin T. Jaynes,
Associate Prof. in Microwave Laboratory,
Stanford University.

120. Mr. Quinn McNemar,
Prof. of Psychology,
Education and Statistics, Stanford University.

121. Mr. John L. Mothershead, Jr.,
Professor of Philosophy, Stanford University.

122. Mr. Robert C. North,
Research Associate,
Hoover Institution, Stanford University.

123. Mr. George F. Sensabaugh,
Professor of English, Stanford University.

124. Mr. Frederic Spiegelberg,
Associate Prof. of Indian Civilization,
Asiatic and Slavic Studies, Stanford University.

125. Mr. Lorie Tarshis,
Prof. of Economics, Stanford University.

126. John M. Warren, Jr.,
Asst. Prof. of Psychology, Stanford University.

127. Dr. William A. Brownell,
Dean of the School of Education,
University of California, Berkeley, Calif.

128. Mr. Sledd, Prof. of English,
U.C. Berkeley, Calif.

129. Mr. Louis Lazaroff,
The Asia Foundation, San Francisco.

130. Dr. H. Chaudhary, Academy of
Asian Studies, San Francisco.

131. Mr. Rudolph Scheffer,
School of Colour and Design,
San Francisco.

132. Dr. Judith Tyburg, Director,
East West Cultural Center,
Los Angeles.

133. Dr. Wesley La Violette,
Retired President of Music Academy,
Los Angeles.

134. Dr. Gale Richards, Speech Dept.,
South California University, Los Angeles.

135. Dr. Forrest Seal, Speech Dept.,
South California University, Los Angeles.

136. Chancellor,
South California University, Los Angeles.

137. Dr. Clifford H. Prator,
Speech Dept.,
South California University, Los Angeles.

138. Miss Yawith, Eng. Dept.,
South California University, Los Angeles.

139. Dr. Stockwell, Speech Dept.,
University of California, Los Angeles.

140. Dr. Butler, Dept. of Drama,
South California University, Los Angeles.

141. Dr. Jones, Dept. of Testing,
South California University, Los Angeles.

सत्यमेव जयते

142. Dr. W. B. Michael, Dept. of Testing,
South California University, Los Angeles.

143. Dr. Sheppard L. Witman,
Director, Cultural and Educational Exchange
Program, University of Pittsburgh, Penn.

144. Mr. Roy S. Heath, Director,
University Counseling Center,
University of Pittsburgh, Penn.

145. Prof. Lawrence Lee,
Prof. of English,
University of Pittsburgh, Penn.

146. Mr. Reuben E. Slesinger,
Economist,
University of Pitsburgh, Penn.

Michigan University, Ann Arbor

147. Prof. Algo Henderson, Chairman,
Department of Higher Education,

148. Dean Willard Olson.
149. Dr. Stanley Seastore.
150. Dr. Cartwright.
151. Mr. Gayle Wilson, Director of Admissions.
152. Dr. Morley Beckett, Director of Health Services.
153. Mr Henry Fuji, Director of University Press.
154. Dr. Edward Groesbeck, Director, Registration and Records.

Central Michigan College

155. Dr. Auspach, President.
156. Miss Johnson, Professor, College of Education.
157. Dr. Kilburn, Director of Testing Service.
158. Dean Nelson, Graduate School of Education.
159. Prof. Pool, Department of Education.

Cornell University, Ithaca

160. Prof. Frank S. Freeman.
161. Prof. T. A. Ryan.
162. Dean F. H. Stutz.

163. Prof. J. Campbell.
164. Prof. Rudolph Corvini.
165. University Testing and Service Bureau.
166. Mr. J. W. McConall, Dean, Graduate School.
167. Prof. Opler, Anthropology.
168. Prof. Belcher, Engineering.
169. Mr. Donald Moyer, Director of Admissions.
170. Asst. Dean Mac Manus, Engineering.
171. Mrs. Humphreyville, Chairman, Committee on Admissions, College of Home Economics.

Colorado State College of Education, Colorado

172. Director of Admissions.
173. Registrar.

Ohio State University, Columbus, Ohio

174. Associate Dean D.A. Severino.
175. Vice-President Mr. Heimberger.
176. Dr. H. Sprouse, Entrance Board.
177. Dr. Frank Fletcher, Testing and Counseling.
178. Dean Cottrell, Education.
179. Dr. Burnett, Student Counseling.
180. Dr. H. Neisonger, Educational Research.
181. Dr. E. Anderson, Chairman, Education Department.

Antioch College, Yellow Springs, Ohio

182. Mr. W. B. Alexander, Vice-President and Dean of Faculty.
183. Dr Mathiasen, Head, Education Department.
184. Mrs. Ruth Churchill, College Examiner.
185. Mrs. P. John, Asstt. College Examiner.
186. Mr. J. Dudley Dauson, Vice-President and Dean of Students.
187. Dr. Arthur E. Morgan, President, Emeritus.
188. Dr. W. Boyd Alexander, Vice-President and Dean of the Faculty.

189. Dr. J. D. Dauson, Vice-President and Dean of Students.
190. Prof. Otto F. Mathiasen, Education.
191. Mrs. Paula Johnson, Asst. to the College Examiner.

Yellow Springs

192. Mr. Louis King, Director, Antioch School.

193. Mr. Augspurger, Superintendent of Yellow Springs School System.

University of California, Berkeley, California

194. Prof. Arthur Jensen, Department of Educational Psychology.
195. Prof. John Loughary, School of Education.
196. Prof. Thomas Holy, President's Office.

California State College

197. Dr. Keene, Vice-President.
198. Dr. Fisk, Prof. of Philosophy.
199. Dr. Felliz, Co-ordinator of Graduate Programs.
200. Dr. Ansell, Director, Counseling Center.
201. Dr. Palmer, Co-ordinator of Advisory Services.

Columbia University, New York

202. Dr. R. Freeman Butts, Director, Social and Philosophical Foundations of Education Division, Teachers' College, Columbia University.

203. Mr. Myer Katz, Guidance Laboratory.
204. Dr. Hibbit, Dean of Columbia College.
205. Dr. James Gutman, Professor of Philosophy.
206. Prof. Gordon Mackenzie.

Buffalo University, Buffalo, New York

207. Vice-Chancellor of Research.

Rochester, New York

208. Rev. John P. O. Meara, Dean, St. John Fisher College.
209. Rev. Russel Pendergast, Professor.
210. Rev. Peter Sheehan, Professor.
211. Rev. Norman J. Murphy, Professor.
212. Rev. John Cavanaugh, Professor.
213. Miss John A. Cappellino, Professor.
214. Mr. Gerard H. Tucker, Registrar.
215. Dr. Ruth Merrill, Dean of Women.
216. Dr. William Fullagar, Dean of the College of Education.
217. Dr. W. H. Coates, Professor of History.

Atlanta University, Atlanta, Georgia

218. Dr. Westerfield, Director, Business Administration.
219. Dr. Bond, Director, School of Education.
220. Dr. Clifford, Professor of Education.
221. Dr. Benjamin E. Mays, President, Morehouse College.

Emory University, Atlanta, Georgia

222. Registrar, Emory University.
223. Dr. Sam. C. Webb, Director of Testing Services.

University of Minnesota, Minneapolis

224. Dean Cook, College of Education.
225. Dr. Kenneth Clark, Psychology Department.
226. Asst. Dean Snoke.
227. Dr. Mestenhauser, Adviser to Foreign Students.
228. Dean Morse, General College.
229. Dr. Berdie, Counseling Office.
230. Dr. R. L. Lathrop, Counseling Center.
231. Dr. Linzy, Psychology Department.
232. Dr. Corcoran, Bureau of Institutional Research.

Harvard University

233. Dr. Francis Keppel, Dean of the Faculty of Education.
234. Dr. David V. Teedeman, Professor of Education.
235. Mr. J. J. Young, Director of Super Aid Program.
236. Dr. Gordon W. Aleport, Professor, Department of Social Relations.

Stanford University

237. Dr. Ernest R. Hilgard, Professor of Psychology.

Berkeley University

238. Mr. C. C. Gillian, Registrar.

Chicago University

239. Mr. William Van Cleve, Registrar.
240. Dr. Herbert A. Theleu, Professor of Education.
241. Dr. C. Arnold Anderson, Professor of Comparative Education.

Newton College of Sacred Heart

242. Miss Mary Quinlan, Dean of Studies.

Wayne State University

243. Mr. G. Baysinger, Professor of Education.
244. Dr. Henry Herrmann, Professor of Education.

New Haven State Teachers' College

245. Dr. Hilton C. Buley, President.
246. Dr. Lewis C. Popham, Asst. to the President.

Genessio College

247. Dr. Wolston, Professor of Education.

Beria College

248. Dr. Smith, Professor.
249. Dr. Chang, Professor.
250. Dean Thomson, Professor.
251. Dean Short, Professor.

Yale University

252. Dr. Setlow, Physics Department.
253. Dr. Lamar, History Department.
254. Dr. Carol, Officer in the Examinations Department.

Purdue University, West Lafayette, Indiana

255. Dr. Arthur H. Tichonor, Adviser to Foreign Students.
256. Dr. Marbury B. Ogle, Head, Department of History, Philosophy and Government.

257. Dr. George Mayer, Professor of History, Philosophy and Government.

Indiana University, Bloomington, Indiana

258. Dean Dowing.
259. Dr. William Marlinson, Counseling Officer.

University of Illinois, Champaign, Urbana

260. Dr. Hastings, University Examiner.
261. Dr. E. C. Seylor, Director of Records.

Kansas State College

262. Dr. M. C. Mozzie, Head, Department of Education.
263. Dr. Varhalen, Professor of Adult Education.

University of Utah, Salt Lake City, Utah

264. Dr. Frank A. Jex, Testing Bureau.
265. Dr. J. A. Norton, Registrar.

Other Universities

266. Miss Goodale, Principal, Kingwood Girls' School, Bloomfield Hills, Detroit.

267. Mr. W. H. Stepp, Registrar, Princeton University.
268. Dr. Ned Bryan, Director, Science Research Associates, Chicago.

269. Dr. French, Professor of Psychology, Washburn University, Topeka.

270. Mr. G. R. Maxan, Registrar, Butler University, Indianapolis.
271. Dr. Ralph N. Casell, Psychologist, Phoenix, Arizona.
272. Dr. P. Miller, Asst. Director of Admissions, California Institute of Technology, Pasadena, California.

273. Dr. H. W. Patmore, Registrar, University of Southern California, Los Angeles.

274. Dr. John S. Helmick, Branch Director, G.T.S., Los Angeles.

Princeton University

275. Professor H. Cantril.
276. Professor W. J. Baumol.

Harvard University

277. Professor Simon Kuznets.

278. Professor A. H. Hansen.
279. Professor J. K. Galbraith.
280. Professor W. Leontief.
281. Professor E. H. Chamberlin.
282. Professor S. E. Harris.
283. Professor G. Haberler.

M. I. T.

284. Professor W. Malenbaum.

Buffalo University

285. Professor R. Ewell.

Rochester University

286. Professor Robert R. France.
287. Professor John Braphy.
288. Professor Oscar Kriegman.

Antioch College

289. Dr. Arthur E. Morgan, Ex-President.
290. Dr. J. D. Dawsan.

सत्यमेव जयते

Wayne State University

291. Mr. E. Cieslak.

Central Michigan College

292. Dr. Charles L. Anspach, President.
293. Mr. D. Kilborn.

Chicago University

294. Professor F. Von. Hayek.

San Francisco State College

295. Professor Alfred Fisk.

Stanford Research Institute

296. Professor A. E. Staley.

Berea College

297. Professor Fu Liang Chang.
298. Dr. Rockwood Chin.
299. Dean Kenneth Thompson.
300. Dean Louis Smith.
301. Professor R. Giffin.

Columbia University

302. Professor A. G. Hart.
303. Professor Arthur R. Burns.

Stanford University

304. Professor L. Tarshis.

Berkeley University

305. Professor Leibenstein.

Pennsylvania University

306. Professor S. Weintraub.
307. Professor N. Rosenberg.
308. Professor Norman Brown.
309. Professor L. R. Klein.
310. Professor R. A. Easterlin.
311. Professor Norman Palmer.

Swarthmore College

312. Professor W. D. Weatherford.
313. Dr. Clande Smith, President.
314. Professor H. S. Perloff, Director, Programme of Regional Studies Resources for the Future, Washington D.C.

सत्यमेव जयते

APPENDIX III

SOME AMERICAN BOOKS ON THE THEORY OF EXAMINATION REFORM

1. Adkins, D.C., et al, *Construction and Analysis of Achievement Tests,* U.S. Government Printing Office, Washington 25, D.C., 1947.

2. Lindquist, E. F., (editor), *Educational Measurement,* American Council on Education, 1951.

3. Remmers, H. H., and Gage, N.L., *Educational Measurement and Evaluation,* Harper and Brothers, 1943.

4. Ruch G. M., *The Objective or New-Type Examination,* Scott, Foresman & Co., 1929.

5. Hawkes, H. E. E. F. Lindquist, and C. R. Mann, *Construction and Use of Achievement Tests,* Houghton Mifflin Co., Boston, 1936.

6. Dressel, Paul, Editor, *Evaluation in General Education,* Wm. Brown, & Co., Iowa, 1954.

7. Smith, Eugene, and R. W. Tyler, *Appraising and Recording Student Progress,* Harper and Brothers, N.Y., 1942.

8. Bloom, B. S. (editor), *Taxonomy of Educational Objectives* Longmans, Green, and Co., New York, 1954.

9. Stern, Stein, and Bloom, *Methods in Personality Assessment,* Free Press, Glenoe, Illinois 1956.

10. Furst, *Constructing Achievement Tests,* (Longmans & Green), U.S.A.

11. *A Simplified Guide to Statistics for Psychology and Education* by G. Milton Smith, (Rinehart & Co., N.Y.).

12. *Measuring Educational Achievement* by W. J. Michaels and M. Ray Karnes.

13. *Measurement in Education* by A. M. Jordon, McGraw Hill.

APPENDIX IV

THE MEMBERS OF THE COMMITTEE OF THE INDIAN EXAMINATIONS REFORM PROJECT

1. Shri V.K. Gokak, Principal, Karnatak College, and now Director, Central Institute of English, Hyderabad-7, Leader of the Group.

2. Dr. C. Asthana, Officer on Special Duty, Examinations Research Projects, and Executive Secretary, Psychometric Unit, Aligarh Muslim University, Aligarh.

3. Dr. F. C. Auluck, Professor of Physics, Delhi University, Delhi.

4. Shri L. B. Deshpande, Controller of Examinations, Osmania University, Hyderabad.

5. Reverend H. A. de Souza, Principal, St. Xavier's College, Ahmedabad.

6. Shri V. K. Kothurkar, Reader and Head of the Department of Experimental Psychology, Poona University, Poona.

7. Dr. S. Misra, Principal, Ravenshaw College, Cuttack, Orissa Province.

8. Dr. N. P. Pillai, Professor of Education, Kerala University, Trivandrum.

9. Dr. R. Prasad, Professor and Head of the Department of Education, Patna University, Patna.

10. Shrimati (Dr.) S. Shridevi, Principal and Professor of Philosophy, Women's College, Osmania University, Hyderabad.

सत्यमेव जयते